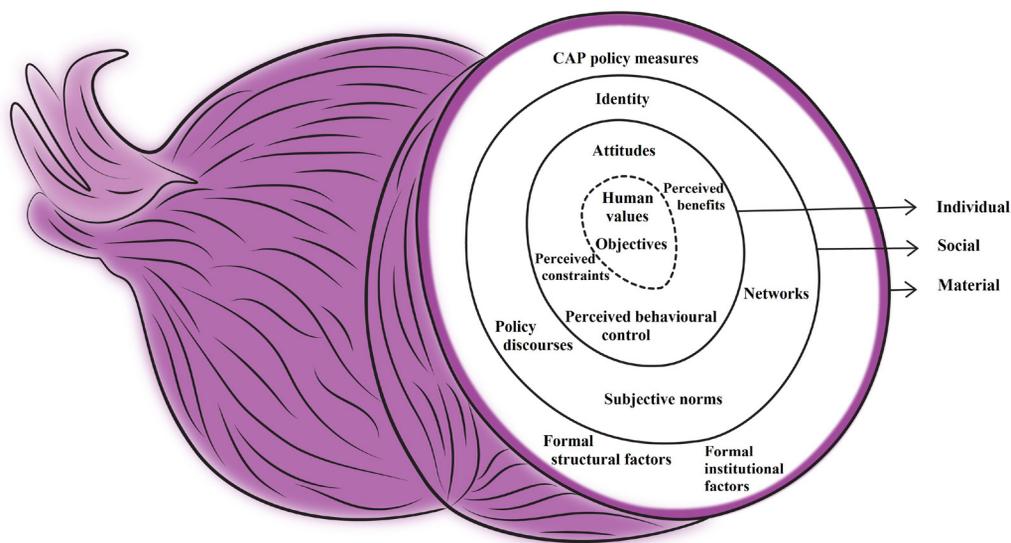




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Exploring layers of factors for farmers' adoption of ecological approaches

GAËLLE LEDUC



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Cover: The onion metaphor, which interlinks the appended papers
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Exploring layers of factors for farmers' adoption of ecological approaches

Abstract

This thesis investigates different “layers” of factors for farmers’ adoption of ecological approaches, namely, *individual*, *social* and *material* layers of factors, with a mixed research methods approach. These layers of factors can be conceptualized using an onion as a metaphor, as factors influencing farmers’ behaviour can originate from the *individual* core, from the *social* environment or *material* environment, representing different layers in the onion. Starting from the outer layers, Paper I is focused on the *material* and *social* context that farmers are subjected to. It investigates how ecological approaches are justified in EU rural development policy by analysing policy discourses in Rural Development Programmes (RDPs) of six EU member states and regions, over three periods of the Common Agricultural Policy (CAP). Secondly, Paper II explores factors from the inner layer of the onion, the *individual* layer, by investigating the types of values that drive farmers in their choice of farming system, specifically either organic or conventional. These two first papers make use of qualitative methods and are followed by Paper III, a systematic map which reviews studies using quantitative methods, from 2010 to 2022, on drivers about farmers’ adoption of ecological approaches. In regard to independent variables, Paper III examines all three layers of factors for adoption: *individual*, *social* and *material*. This thesis ends with Paper IV, a quantitative analysis exploring the role of behavioural factors on farmers’ adoption of agroforestry practices, including factors from the *social* and *individual* layers. It aims to fill the research gap found from results of Paper III on lack of evidence of identity as a driver for adoption.

Keywords: farmers’ decision-making, ecological approaches, mixed research methods, public goods

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En undersökning av faktorer som påverkar jordbrukarnas antagande av ekologiska metoder

Sammanfattning

I denna avhandling undersöks olika “lager” av faktorer som påverkar jordbrukarnas antagande av ekologiska metoder, nämligen individuella, sociala och materiella lager. För att utföra detta används en blandad forskningsmetod (mixed methods). Dessa olika lager kan konceptualiseras genom att använda en lök som metafor, eftersom faktorer som påverkar jordbrukares beteende kan härröra från den individuella kärnan, från den sociala miljön eller från den materiella miljön, som representeras genom olika lager i löken. Artikel I, som utgår från de yttre lagren, fokuserar på det materiella och sociala sammanhang som jordbrukarna befinner sig i. I studien undersöks hur ekologiska metoder motiveras i EU:s landsbygdsutvecklingspolitik genom att analysera politisk diskurs i landsbygdsprogrammet i sex EU-medlemsstater och regioner, under tre perioder av EU:s gemensamma jordbrukspolitik. Därefter, utforskar Artikel II faktorer från lökens inre lager, det individuella lagret, genom att undersöka vilka typer av värderingar som driver jordbrukarna i deras val av jordbrukssystem, närmare bestämt mellan ett ekologiskt eller konventionellt system. De två första artiklarna använder sig av kvalitativa metoder, medan Artikel III är en systematisk kartläggning över kvantitativa studier, från 2010 till 2022, om drivkrafter bakom jordbrukarnas antagande av ekologiska metoder. När det gäller de oberoende variablerna undersöker Artikel III alla tre nivåerna av faktorer för antagande: individuella, sociala och materiella. Denna avhandling avslutas med Artikel IV, en kvantitativ analys som undersöker beteendefaktorens betydelse för jordbrukarnas antagande av skogsjordbruksmetoder, inklusive faktorer från de sociala och individuella nivåerna. Syftet är att fylla den forskningslucka som framkom genom resultaten i Artikel III angående bristen på evidens för att identitet är en drivkraft i antagandet av specifika metoder.

Nyckelord: jordbrukares beslutsfattande, ekologiska tillvägagångssätt, mixed methods, allmännytt

Dedication

To my mother, Sylvie Leduc, whose bravery inspires me every day.

To the memory of Professor emeritus Yves Surry, who sowed the seeds of my academic pursuits at SLU.

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List of publications

This thesis is based on the work contained in the following papers, referred to by Roman numerals in the text:

- I. Leduc, G.*, Manevska-Tasevska, G., Hansson, H., Arndt, M., Bakucs, Z., Böhm, M., Chitea, M., Florian, V., Luca, L., Martikainen, A., Pham, H.V., & Rusu, M. (2021). How are ecological approaches justified in European rural development policy? Evidence from a content analysis of CAP and rural development discourses. *Journal of Rural Studies*, 86, 611-622
- II. Leduc, G.*, Billaudet, L., Engström, E., Ryan, M. & Hansson, H. Farmers' perceived values in conventional and organic farming: a comparison between French, Irish and Swedish farmers using the Means-end chain approach. (under review in *Ecological Economics*)
- III. Thompson, B., Leduc, G.*, Manevska-Tasevska, G., Toma, L. & Hansson, H. Farmers' adoption of ecological practices: a systematic literature map. (under review in *Journal of Agricultural Economics*)
- IV. Leduc, G.* & Hansson, H. Investigating farmers' behavioural drivers for adopting agroforestry practices – An extended theory of planned behaviour framework. (manuscript)

* Corresponding author. Papers I is reproduced with the permission of the publisher.

The contribution of Gaëlle Leduc to the papers included in this thesis was as follows:

- I. I developed the conceptual framework, study design, administrated the project, collected and analysed the data and wrote the initial and final version of the manuscript together with the second author. The third author was also involved in the design of the study, the administration of the project and the writing of the initial and final version of manuscript. The rest of the co-authors collected and analysed the data. I managed all correspondence with the journal editors.
- II. I developed the study design and administrated the project together with the senior author. I developed the conceptual framework. I led the data collection for Sweden and the co-authors from other countries collected data in their respective countries under my supervision and the one of the senior author. I then analysed the data and wrote the first draft of the manuscript. We all contributed to the final version of the manuscript.
- III. The first and senior authors developed the study design and administrated the project. The study design was however discussed with myself and the rest of the co-authors. The first author collected the data and we all analysed it. The first author developed an initial draft and I, together with the senior author wrote the final version of the manuscript.
- IV. We developed the problem formulation, hypotheses and study design. I undertook the data collection and analysis of the data. I prepared the initial draft and wrote the final version under the supervision and guidance of the co-author.

Abbreviations

AES	Agri-environment schemes
CAP	Common Agricultural Policy
ES	Ecosystem services
EU	European Union
FPB	Financial, business or productivity
HVM	Hierarchical Value Map
ISM	Individual-Social-Material
LIFT	Low-Input Farming and Territories
MEC	Means-end chain
MS	Member states
RD	Rural Development
RDP	Rural Development Programmes
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action

1. Introduction

This thesis is focused on farmers' uptake of ecological approaches and aims to augment economic theory with behavioural and sociological theories to understand farmers' decision-making. This research topic is motivated based on both theoretical and empirical grounds, which are discussed below.

1.1 Background and motivation

“If we want to know how or why a farmer acts in a certain way or how to induce him to act in a certain way, we have to enquire why men act, and especially why men act as they do when they live in the sort of social environment and general circumstances in which farmers live” (Ashby, 1926)¹

This quote from Arthur Ashby, one of the pioneer of agricultural economics in England (Bateman, 1980), emphasizes the need to consider farmers' motivations in a broader context than the sole economic one, to understand farmers' actions. Contrastingly, neoclassical economic theory postulates that economic agents' behaviours are driven by a unique motivation: profit maximization (Gasson, 1973; Colell et al., 1995). The social context or other types of motivations are abstracted by these theories, for modelling economic decision-making. In this decision process, agents are assumed rational, perfectly informed about alternatives as they maximize their expected profits, whether by maximizing revenues or minimizing costs, given various constraints. While suitable for mathematical modelling, these

¹ This quote only refers to farmers as men which reflects the time of its publication. I do consider that female farmers are also driving farming businesses nowadays.

assumptions have been questioned, notably with the pioneer work of Herbert Simon and his concept of bounded rationality (Simon, 1964). Rationality is bounded as information about alternatives is incomplete. Therefore, given the complexity of the reality and individuals' cognitive limitations to acquire and process information, Simon suggests that decision-makers do not seek an "optimal" solution, that requires maximizing, but rather a "satisfactory" solution that meets some predetermined aspiration level (Simon, 1964; Teraji, 2018). Work in agricultural economics have shown that farmers are both driven by financial and non-financial motives when conducting their activity (Gasson, 1973; Willock et al., 1999; Hansson et al., 2013; Howley, 2015). Furthermore, other studies have shown that farmers who engage in activities that appear irrational from a financial standpoint, as not maximizing economic returns, do so because of other non-financial motives (Mzoughi, 2011; Howley et al., 2014; Hansson et al., 2020; Adamie & Hansson, 2021). Notwithstanding the importance of economic factors and motives driving farmers' decisions (Khaledi et al., 2010; Williamson, 2011; Pilarova et al., 2018) researching on non-economic and rather more social and psychological variables appear paramount to better understand what other factors enter the utility function of farmers, as they may maximize utility rather than profits per se. Seeking profit maximization may appear legitimate for the archetype of "economic" farmer. But even for this archetype, this farmer may pursue this goal for other motives such as providing support for family or developing the farm business, which involves other employees (Gasson, 1973). Besides, this farmer may also indirectly want to take care of the environment, to achieve profit maximization, as climate hazards or biodiversity loss may negatively impact their production. Farmers may not always be this narrowly defined self-oriented *homo economicus*, when pursuing their activity, but also consider others and the environment in the choices they make, such as when deciding to implement ecological approaches. A better understanding of farmers' motivations, social and environmental factors, can help to improve current economic modelling and better predict farmers' behaviour. To this purpose, the thesis gives special attention to psychology and sociology theories that help in the uncovering of these non-directly observed variables in current economic modelling of decision-making.

Choosing a specific mode of production, by deciding to work with specific farming practices or by adopting a specific farming system, is a

choice that has economic implications for the farm. In fact, in this decision, farmers ought to mobilize and manage specific types of resources, capital and/or labour inputs, and subsequently, decide on how to market their produced outputs. Deciding on how to farm, for instance, whether in an ecological way or not, therefore impacts the economic system the farm is set in. This thesis specifically focuses on farmers' motivations to farm in an ecological way or, in other words, their motivations for adopting ecological approaches to farming.

Ecological approaches, in this thesis, refer to either farming systems or farming practices that have potential to directly or indirectly generate ecosystem services (ES). ES are classified into four main categories: provisioning, supporting, cultural and regulating services (Assessment, 2005). When it comes to agricultural ES, agriculture is primarily managed for delivering provisioning types of services such as food, fuel and fibre which themselves depend upon the supporting and regulating types of ES, for instance pollination and soil fertility (Zhang et al., 2007). If managed in an ecological way, agriculture has the potential to provide additional regulating (e.g. carbon sequestration, water quality), supporting (biodiversity conservation, soil fertility) and cultural services (recreation, aesthetics) (Swinton et al., 2007). Conversely, if ecological interactions and feedback loops within agricultural systems are ignored, farming can harm ES, creating negative externalities such as nutrient runoff causing water pollution, societal health risks caused by excess use of pesticides etc. These negative externalities come from farming based on more conventional practices which may not take into account inter-dependencies between natural and human elements of an ecosystem (Dwyer et al., 2015). Agriculture is then seen as an opportunity to solve this market failure by instead managing common resources with care and answer societal needs through the provision of ES, which are cast as public goods in the policy sphere, such as for instance in the policy report of Cooper et al., (2009). While ES and public goods differ but overlap (Dwyer et al., 2015), they are both promoted as providing benefits for farmers and society in general.

Furthermore, improving farmers' uptake of ecological approaches can pave the way for building more sustainable and resilient food systems that recent global crises have more than ever emphasized the need for. Since the invasion of Ukraine by Russia, global agricultural markets are in great turmoil because of anticipated and realized disruptions of exports from the

Black Sea region, especially concerning grain and energy markets (Von Cramon-Taubadel, 2022). While food and fertilizers' prices were already rising before the crisis, because of supply disruptions due to the pandemic and the increasing food demand from Asia, this situation exacerbates food security vulnerability (Abay et al., 2022). This emphasizes the urgent need to question our dependency on global food markets and external inputs and therefore reassess the way we produce food, since not only consumers, but also producers are impacted. One way to limit our dependency and enhance our agricultural resilience is to incentivize farmers to transition towards ecological farming, which among others, reduce the need for external inputs such as fertilizers or imported animal feed. Furthermore, some ecological practices such as crop diversification have proven to be economically viable for farmers as research have shown that farmers can benefit financially from these practices (Bowles et al., 2020; Nilsson et al., 2022).

Turning to agri-environmental policy, one major policy challenge of the new CAP 2023-2027 is to improve the performance of agriculture in terms of climate action, environmental care and preservation of biodiversity and landscapes (Lampkin et al., 2020). To this end, new regulations with two main changes are put forward (Dessart et al., 2021): i) a stronger set of mandatory requirements in terms of ecological practices (e.g. crop rotation, conservation of wild habitats) to be implemented by farmers in order to receive direct payments, ii) introduction of eco-schemes, which are new policy instruments that reward farmers for implementing ecological approaches on a voluntary basis. While being voluntary for farmers, it is mandatory for EU member states (MS), as part of Pillar I, to include one or more eco-schemes in their CAP strategic plans. It also gives more flexibility to MS to adapt policy to their specificities as they are now able to choose which eco-scheme to implement, in comparison to previous Greening Direct Payments which imposed a set of common practices for all MS (Lampkin et al., 2020). This new green architecture highlights the increasing attention of the CAP given to ecological approaches. Especially, the European Commission provides a list of examples of ecological approaches that could be supported by eco-schemes and the associated ecosystem services that they would provide (European Commission, 2021). This signals more concrete ambition from the EU who also calls for more responsibility from EU MS to incentivize farmers for larger uptake of these approaches. Hence, a better understanding of farmers' motivations for adopting such approaches appears

necessary for achieving these ambitions. Especially, not only financial incentives and support should be considered for more efficient design of agri-environmental policy, but also through leveraging of behavioural factors that can fundamentally and possibly, more sustainably induce farmers' transition to these approaches (Dessart et al., 2019; Le Coent et al., 2021). The cross-country analyses adopted in two papers of this doctoral thesis provide information on how driving factors can be understood at different EU national levels. This can help for better adapting and justifying the support of eco-schemes to national contexts.

Finally, while the New CAP regulations aim to be aligned with the ambitions of the European Green Deal (e.g. reduce use of chemical pesticides and nutrient losses by 50% by 2030), understanding drivers of farmers' adoption of ecological approaches is also beneficial for reaching more global ambitions such as the Sustainable Development Goals (SDGs) set by the UN. For instance, more uptake and transition to organic farming could tackle several of the 17 SDGs: No Poverty (SDG 1), Zero Hunger (SDG 2), Good Health and Wellbeing (SDG 3), Clean Water and Sanitation (SDG 6), Responsible Consumption and Production (SDG 12), Climate action (SDG 13) and Life on Land (SDG 15) (Eyhorn et al., 2019). In the case of SDG 6 and 3 for example, low pesticides use and residues would help to achieve these goals, while higher profitability with higher premium from organic products would help achieving SDG1 for farmers (Seufert & Ramankutty, 2017).

1.2 Aim and research questions

In the context of the aforementioned challenges at the European level with the new CAP ambitions, the current global food and energy supply shocks and, in parallel, some SDGs previously mentioned above, this thesis aims to understand the role of various types of factors that motivate or inhibit farmers' decisions for adopting ecological approaches. Each paper composing this thesis looked at specific types of factors, with an aim and associated research question, as shown in Table 1. Following the Individual-Social-Material (ISM) model of Darnton & Evans (2013), these factors can be distinguished into three main layers or categories: *individual*, *social* and *material*. The ISM model was originally developed by Darnton & Evans, (2013) as a tool for policy-makers from the Scottish government and other

practitioners to incentivize individual's behaviours in relation to SDGs. Inman et al., (2018) applied this model to study farmers' mitigation practices in relation to water pollution. As this thesis deals with individuals' behaviours, farmers' adoption of ecological approaches, using this model as a general framework is suitable. I provide further details about the ISM model and discuss its appropriateness for this doctoral thesis in section 2.1. Since I investigate a set of factors from these three categories, three broad research questions can be formulated:

- *What types of individual factors influence farmers' adoption of ecological approaches and how do they influence it?*

Within this category of factors, I use the terminology of Dessart et al., (2019) who distinguish between *cognitive* and *dispositional* types of individual factors that affect adoption of ecological approaches. Cognitive factors refer to variables that relate to learning and reasoning and are seen as "proximal" that is, practice-specific. Contrastingly, dispositional factors are "distal" as they are relatively more stable and can affect many decisions, not only the adoption of ecological practices.

- *What types of social factors influence farmers' adoption of ecological approaches and how do they influence it?*
- *What types of material factors influence farmers' adoption of ecological approaches and how do they influence it?*

Contributions to these research questions are discussed in Chapter 5. Then, zooming in on the thesis and considering each paper separately, several more targeted research questions are explored (see Table 1). Paper I starts with the outer layers of the model, exploring material and social types of factors that farmers are subjected to, including policy-makers' ideas and associated policy measures on ecological approaches. Paper II uncovers instead factors from the inner layer of the model, an individual type of factor: farmers' values. The thesis then presents, in Paper III, evidence from the quantitative literature investigating all three layers of factors: individual, social and material, more precisely behavioural, social, formal institutional, farm structural and socio-demographic types of factors. Finally, paper IV investigates the role of factors from the individual and social layers,

including constructs from the Theory of Planned Behaviour, farmers' economic identity, their network memberships, conservation objectives, perceived economic benefits and perceived labour constraints (see Table 3 in Chapter 2).

Table 1. Aim and research questions of each paper composing the thesis

Paper	Aim	Research question(s)
I	To investigate how ecological approaches are promoted from a public good perspective, through policy discourses, within national policy documents.	<ul style="list-style-type: none"> - What types of public goods are promoted, through discourses, for supporting ecological approaches across EU MS and regions? - What policy discourses prevail in each CAP period? - How much have ecological approaches been mentioned in RDPs?
II	To uncover and compare the underlying values that motivate farmers in their choice of production type (conventional vs. organic) in a set of EU countries and to understand farmers' decision making through mental representations.	<ul style="list-style-type: none"> - What underlying values drive farmers' decision to run either a conventional or an organic farm? - How do farmers characterize their choice of mode of production system and how to they reason about it?
III	To synthesize and structure evidence from the quantitative peer-reviewed literature investigating ecological approaches, between 2010 and 2022.	<ul style="list-style-type: none"> - What factors are mostly researched by the quantitative literature on adoption of ecological approaches? - How were these scientific studies undertaken?
IV	To investigate the role of behavioural factors for farmers' adoption of agroforestry practices	<ul style="list-style-type: none"> - What factors drive or hinder farmers' adoption of agroforestry practices? - How do some of behavioural constructs influence adoption?

It is worth noting that other terminologies have been used in the literature to refer to similar types of approaches to farming such as “sustainable farming practices” (Groth-Joynt et al., 2020; Dessart et al., 2019), “environmentally friendly farming practices” (Mozzato et al., 2018) or “nature conservation practices” (Lokhorst et al., 2011). The term “sustainable farming” is a broader concept (Rega et al., 2018) which also

includes social goals for agriculture such as good working conditions, equity, strong communities (Velten et al., 2015). As for “nature conservation practices” this term is instead too narrow for this thesis as it could be misunderstood as being associated with the farming system of conservation agriculture (Rega et al., 2018). Similarly, “environmentally-friendly farming” is also too narrowly defined because of the potential economic and social benefits that ecological approaches are advocated for. This thesis explores factors of farmers’ adoption of two types of ecological approaches: organic farming in Paper II and agroforestry practices in Paper IV. Furthermore, ecological approaches are studied in their integrity when studying the policy discourses about these approaches in Paper I and when reviewing the literature on factors of farmers’ adoption of these approaches in Paper III.

1.3 Structure of the thesis

To answer the stated research questions above, this thesis is based on four papers. A glimpse of theories and methods are outlined in Table 2.

Table 2. Outline of empirical studies

Paper	Theoretical or conceptual framework	Method	Data
I	Integrated conceptual framework of policy discourses including CAP and RD discourses	Deductive content analysis	Qualitative
II	Means-end chain approach and Rokeach framework	Laddering interviews	Qualitative
III	Various behavioural models gathered	Systematic map	Qualitative ²
IV	Theory of planned behaviour	Factor analysis and logit regressions	Quantitative

Paper I starts by investigating, with a deductive content analysis, how policy-makers justify the support of ecological approaches in RDPs of six EU member states and regions, over three CAP periods. It therefore provides insights about factors from the outer layers of the onion that can influence farmers’ behaviours in terms of policy opinions and views about these

² While the analysed data from the systematic map are scientific articles, therefore text which is qualitative data, analysis of significance of independent variables involves dealing with regressions and therefore numbers. The material analysed in this paper can therefore be considered hybrid.

practices and how the associated policy measures are framed or communicated in national policy documents. Paper II analyses instead the core of the onion: farmers' individual factors in terms of human values, which drive them in their decision of mode of production, conventional vs. organic. Farmers' values and ways of reasoning were uncovered through laddering interviews and values were subsequently classified along Rokeach (1973)'s framework as instrumental and terminal types of values. Paper III looks at all layers of the onion with a systematic map of the literature that describes and structures evidence of observational studies which analyse farmers' adoption of ecological approaches. Finally, Paper IV looks at the two inner layers of the onion, individual and social types of factors that drive farmers to adopt agroforestry practices, by augmenting the Theory of Planned Behaviour (Ajzen, 1991) with additional behavioural constructs, including economic identity.

I now continue by introducing in Chapter 2 the theoretical framework that positions the papers of this thesis together with theoretical frameworks that I applied and developed before discussing the methodological approach and data used in this thesis, in Chapter 3. Chapter 4 provides a summary of the appended papers. Finally, I discuss in Chapter 5 the results of this thesis, based on the three broad research questions formulated in 1.2, and provide implications for policy and future research.

2. Theoretical framework and positioning of the papers in the thesis

This doctoral thesis uses a combination of theoretical frameworks that originate from psychology and sociology, which I apply to answer research questions relevant to advance knowledge in the fields of agricultural economics and behavioural economics.

This chapter begins by integrating each of my PhD papers within the Individual-Social-Material (ISM) model in order to situate each of investigated behavioural factors within a broader frame. It then continues by presenting each theoretical or empirical framework the thesis either applies or develops, and justifies their use.

2.1 Theoretical structure of the thesis

As my thesis borrows theoretical frameworks from psychology and sociology, and applies them to answer questions about farmers' behaviours, which are relevant for the fields of agricultural and behavioural economics, this thesis can be considered as interdisciplinary. The original version of the ISM model identifies a variety of factors that brings different disciplines together, namely, behavioural economics, sociology and psychology. It therefore also emphasizes the usefulness of interdisciplinary research. Especially, it shows how behavioural economics can be supplemented by psychology and sociology to understand and predict behaviour. Darnton & Evans, (2013) organize their factors across different categories by placing them into different contexts: 1) individual, 2) social and 3) material. It first starts from the core which aims at understanding the individual behaviour and includes factors that affect individual choices and their actions (see Figure 1). It then sets it within a social and then material context which

depicts how individuals' decision-making and actions are influenced by multiple external actors. The social context comprises societal influences while the material context includes factors from the outer world, that individuals do not have control over but which constraint or enact their actions (Darnton & Evans, 2013). Table 3 shows how the thesis papers can be set within these different contexts, or categories of factors.

Figure 1. Schematic representation of the ISM model, adapted from Darnton & Evans (2013)

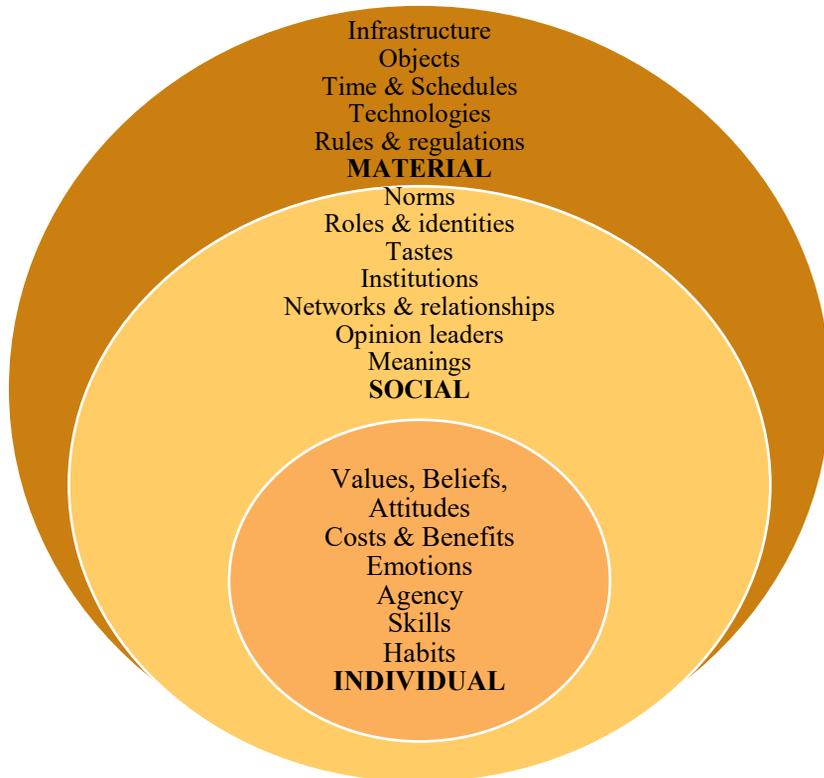


Table 3. My thesis papers within the ISM model

Categories of factors from the ISM model	Paper I	Paper II	Paper III	Paper IV
Individual		Human values	Behavioural factors	-Attitudes -Perceived behavioural control -Perceived economic benefits -Perceived labour constraints -Conservation objectives
Social	Opinion leaders as policy discourses		Social factors	-Identity -Networks -Subjective norms
Material	Formal rules and regulations of the CAP: policy measures		-Formal institutional factors -Farm structural factors	

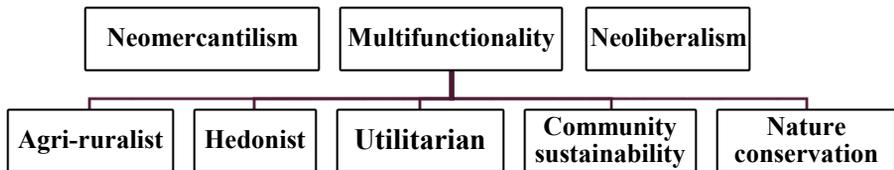
2.2 Theoretical and empirical frameworks applied

2.2.1 Concept of policy discourse and integrative model of policy discourses

Policy discourses can be seen as the expression or support of well-established policy paradigms, which correspond to frameworks integrating linguistic and normative dimensions that govern the policy process (O’Sullivan, 1993; Alons, 2017). More precisely, policy paradigms include ideas related to the understanding of a policy problem, to the types of appropriate policy goals and policy instruments to achieve them (Hall, 1993). Paper I analyses these conceptions of “what can and should be done in a sphere of policy” (Hall, 1993: 290), in the case of agri-environmental policy, more specifically in regard to the support of ecological approaches. As this paper focuses on policy discourses about ecological approaches, from Rural Development

Programmes (RDPs), which are designed under the second pillar of the CAP, a conceptual framework integrating both CAP discourses (Potter & Tilzey, 2005) and socio-political discourses of rural development (RD) (Hoggart et al., 1995; Frouws, 1998; Elands & Wiersum, 2001) was developed (see Figure 2.)

Figure 2. Conceptual framework integrating CAP and RD discourses, adapted from Leduc et al., (2021)



In addition to provision of food for society, the primary function of agriculture, contemporary farmers are expected to provide ecosystem services to society (Dominati et al., 2019), which are conceptualized as public goods in the policy discourse. Except for neoliberalism, each policy discourse (Fig. 1) supports and justifies the implementation of ecological approaches as accomplishing a specific function for society (protection of the environment, aesthetic functions etc.) which can be understood as public goods. Several of these public goods justify policy intervention as it aims to handle market failure in terms of negative externalities generated from agriculture. It is worth noting that, while public goods are originally defined as non-excludable and non-rival goods in neoclassical economic theory (Samuelson, 1954), the concept of multifunctional agriculture, in the policy debate, defines public goods from agriculture with a wider approach. In fact, this approach is not restricted to pure public goods (biodiversity, landscape, sustainable water management) but also includes private goods and services (bio-energy, tourism) as well as “functions” that are only indirectly linked to agricultural production (rural vitality, aesthetics, animal welfare) (Vanni, 2013). Overall, Vanni, (2013) categorizes public goods from agriculture into two: environmental goods that are closely related to environmental externalities (biodiversity conservation, water quality, climate stability etc.) and social goods that are rather related to the social dimension of agricultural activities (animal welfare, health, rural vitality, food security).

Analysing policy discourses in relation to ecological approaches is useful for understanding the rationale behind agri-environmental policy

intervention. In fact, policy measures incorporate specific policy philosophies, goals and ambitions, while institutionalizing it through concrete actions (Hall, 1999; Jordan et al., 2013). Better understanding of policy philosophies and therefore rationales of policy measures, are deemed important to understand the CAP political agenda, what direction agricultural policies have taken and intend to take. Ultimately, rules and regulations, constitute this outer world with material conditions that constrain and shape farmers' actions and choices (see Figure 1). Furthermore, as we assume that differences in RDPs' policy measures promoting ecological approaches across EU member states originate from differences in societal understanding of externalities in agriculture, the study reveals differences and similarities of societal views about ecological approaches, especially in terms of understanding of types of public goods that they can provide.

In discursive psychology, speakers, in our case, policy-makers, aim for a deeper social end, to convey and construct identity for social actors, in our case, farmers (Edwards, 1991; Lähdesmäki & Vesala, 2022 forthcoming). In fact, for instance, the notion of a "good farmer" advocating productivist aspects of agriculture, which links to the neomercantilist discourse, was constructed not only by the farming culture but by society in general (Burton & Wilson, 2006), including policy-makers. Self-identity is a socially constructed concept which "develops through affirmation and reaffirmation in social discourse" (Burton & Wilson, 2006:105). As it is analysed in Paper I, the types of policy discourses in relation to ecological approaches, over three CAP periods, parallel the evolution of promotion and construction of farmers' roles when it comes to implementing ecological approaches, which can be linked to farmers' role identity. As emerging literature have shown that identity does play a role for farmers' behaviours (McGuire et al., 2013; Groth-Joynt et al., 2020; Cullen et al., 2020; Zemo & Termansen, 2021), studying policy discourses in agricultural economics appear useful to understand the social contextual factor that indirectly influence farmers' behaviour, that is, through the construction of role identities for farmers. Paper IV of this thesis explores the direct link between economic identity and farmers' adoption.

2.2.2 Empirical and theoretical frameworks to uncover and classify farmers' values

Since human values are abstract variables driving individuals' behaviours, it can appear challenging to capture and measure such concepts from farmers' mind. For Gasson, (1973), they can only be approached indirectly through observed behaviours or verbal responses. Verbal measures include ranking, rating or assessing agreement of predefined items embodying values, responses to questions on scenario involving choices or opened-ended questions about what is important or desirable (Gasson, 1973). Open-ended questions appear more reasonable to uncover farmers' values; as they might themselves not be aware of; rather than using pre-defined statements or questionnaires that influence respondents to reason and answer within a definite theoretical frame. One powerful approach to reveal individual's values is the Means-end chain (MEC) approach of Gutman, (1982) which was originally developed in marketing to understand consumers' decision-making. The MEC approach assumes that consumers' purchasing decisions are not based on the attributes of the products themselves (e.g. tasty, colourful), but based on the values or desired end-states that these indirectly satisfy. This approach has been recently used in agricultural economics to understand farmers' behaviour (Hansson & Lagerkvist, 2015; Hansson & Kokko, 2018). In order to link behaviour and values, the MEC approach theorizes a hierarchical cognitive structure which depicts how consumers characterize their choices in terms of attributes (denoted as A), what consequences (C) they perceive from these attributes, and finally what values (V) they associate with these consequences (Reynolds & Gutman, 1988). To uncover these linkages, the open-ended question "Why is that important to you?" is asked as a probe with laddering interviews (Reynolds & Gutman, 1988). Paper II applies the MEC approach in order to understand farmers' choice of farm production system, whether conventional or organic. The MEC approach provides several advantages to understand farmers' behaviour in agricultural economics. First of all, it is useful to uncover the "real" values that drive their decision. Second, it provides a deeper understanding of farmers' reasoning and decision-making in terms of linkages of concepts between attributes, consequences and values. Especially, comparing cognitive structures based on the A/C/V hierarchy, across farmers who made different choices, can enhance the understanding of farmers' priorities. For instance, the motivation to conserve nature might

be a *consequence* that leads to the *instrumental* value of productivity for farmers driven by economic rationales while conserving nature might be a purpose in itself for farmers driven by environmental rationales, and be conceptualized at the *instrumental* value level instead.

In terms of systems of classification of values, different theoretical frameworks have been applied or developed in the literature to study farmers' behaviour. First, as in-depth theory of the concept of human values originally comes from psychology, two major frameworks from that field have been adopted to study farmers' values as drivers of behaviour (Hansen and Greve, 2014 ; Baur et al., 2016): the Rokeach (1973) framework and the Theory of Basic Human Values developed by Schwartz (1992) which classifies 10 human values on a diagram based on their level of compatibility. Second, typologies of farmers' values have also been developed directly from studies of the agricultural economics literature, in relation to farmers' choices and decision-making. These studies were of two kinds: studies that focused on values in relation to farmers' occupation (Gasson, 1973; Willock et al., 1999; Maybery et al., 2005; Ferguson & Hansson, 2013) and studies that focused on values in relation to farmers' farming practices (McInerney, 2004; Barnes et al., 2011; Lagerkvist et al., 2011) . Paper II classifies farmers' values within Rokeach (1973)'s theoretical framework which distinguishes between *instrumental* values and *terminal* types of values. While instrumental values correspond to desirable modes of conduct and provides a mean by which an end goal can be accomplished, terminal values are desirable end-states of existence. *Instrumental* values are assumed to lead to a more abstract, *terminal* type of value. These two types of values are further divided in two categories. *Terminal* values can be either personal that is, self-oriented, or social, as focused on others. Similarly, *instrumental* values can be differentiated between moral and competence values. First of all, Rokeach (1993)'s framework has the advantage to conceptualize values with rather broad definitions, which is useful in order to not "overfit" farmers' answers within more narrowly defined categories. Second of all, the hierarchical differentiation between *instrumental* and *terminal* values of the framework provides a dimension along which organic and conventional farmers could potentially be compared. In fact, farmers who would rather end their reasoning based on *instrumental* types of values (e.g. "to earn a living") would signify that these goals are self-sufficient for them and are therefore less driven by personal (or social) more abstract states of existence

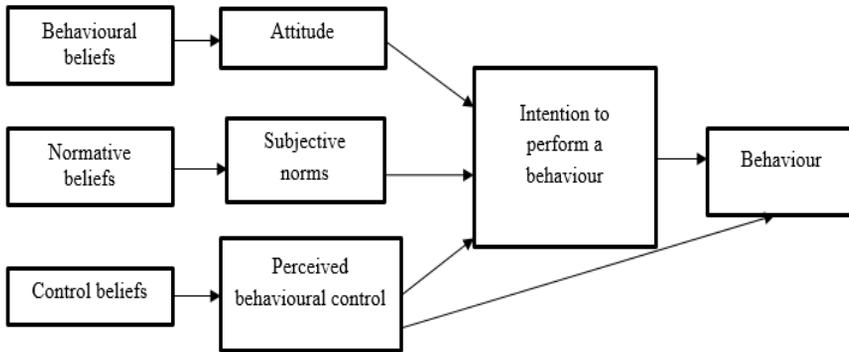
(e.g. security) when conducting their activity. This could explain that these farmers are more driven by occupational types of values, as instrumental values can be paralleled to purposes of activity (of competence or moral type), while others are more driven by personal (or social) values, in their choice of production system. Rokeach's psychological framework therefore appears as a useful theoretical framework for agricultural economics in order to better understand different types of farmers' motivations in their choice of economic activity.

This thesis, with Paper II, also contributes to the conceptualization of farmers' values by defining two types of value categories: financial, business or productivity (FBP) types of values and non-financial, non-business, non-productivity. Compared to the pecuniary and non-pecuniary types of benefits identified by Howley, (2015), this typology integrates the business and productivity types of motivations that are lacking to the mere monetary or financial ones, and which need to be differentiated. In fact, our data shows that farmers distinguish these three notions when justifying their choices. FPB and non-FPB values are therefore inductive types of categories. They were defined in order to discuss our results in regards to *consequences* and *instrumental* values and compare them across organic vs. conventional farms.

2.2.3 Theory of Planned Behaviour to predict farmers' adoption

The Theory of Planned Behaviour assumes that individual's behaviour originate from their intention to perform the behaviour (Ajzen, 1991). It originates from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) in which two main predictors were in focus: attitudes, that are formed based on individual's behavioural beliefs about the possible consequences of an action and subjective norms, which are based on normative beliefs which correspond to the likelihood that important referent individuals or groups approve or disapprove of performing a given behaviour (Ajzen, 1991). Yet, the TRA performed poorly in studies from the 1980s (Burton, 2004). Individuals who hold a positive attitude and a perception that others in the surrounding social network support the behaviour, were found not sufficient for individuals to enact a behaviour. Ajzen, (1985) then revised by adding on the psychological construct of perceived behavioural control which measures that individuals also need to perceive that they are able to influence and control the behaviour.

Figure 3. The TPB model, adapted from Ajzen, (1991)



Compared to human values³ which are rather more habitual and deeply anchored in individuals' mind, as life-principles directing choices, the TPB emphasises psychological constructs predicting behaviour that is said to be reasoned or planned. More precisely, the TPB focuses on the more controlled aspects of decision-making, where actions are directed by goals and steered by self-regulated processes (Sok et al., 2021). Ajzen, (2011) however emphasizes that this does not mean that individuals in this model are assumed rational, as not subjected to biases with beliefs that accurately represent reality, but rather that the formation of their attitudes, perceived subjective norms and perceived behavioural control follow automatically and consistently from their beliefs. Furthermore, as explained in the introduction, farmers' values are *dispositional* behavioural types of factors, considered as more stable over time and relatable to multiple behaviours, while the TPB constructs belong to *cognitive* factors, which are more subject to change and practice-specific, so possibly, more amenable by policy incentives than moral values.

The TPB has been applied to a large variety of farmers' behaviours such as farm diversification (Hansson et al., 2012; Senger et al., 2017), environmental accounting practices (Tashakor et al., 2019) or on-farm food safety (Rezaei et al., 2018). While other social-psychological models including the Technology of Acceptance Model (Davis, 1989) or the Value-Beliefs-Norm theory (Stern et al., 1999) have been applied to study farmers'

³ Defined by Rokeach (1993) as an "enduring" type of belief

adoption or intention to adopt ecological approaches, Delaroche (2020) highlights that the TPB appears as the most applied model in this literature, in the last recent years (Farani et al., 2019; Caffaro et al., 2019; Bonke & Musshoff, 2020; Small & Maseyk, 2022). The popularity of the TPB comes from its success to predict behaviour and intention, at least in health-behaviour related studies (Ajzen & Manstead, 2007). One other explanation for the TPB's prevalence in agricultural economics is its convenience for application as well-established guidelines are available to measure the socio-psychological constructs (Fishbein & Ajzen, 2010). This enables economists with no background in social psychology, to apply the theory in a straightforward way (Sok et al., 2021). However, the reviews of Sok et al., (2021) and Borges et al., (2019) reveal that studies using the TPB to study farmers' behaviour do not often apply the theory with quality. For instance Borges et al., (2019) point out that few studies include all the TPB or TRA's constructs in a complete manner or measure these constructs in a consistent way, which makes it difficult to identify clear patterns of significance of these models in the farmer adoption of innovation literature.

Limitations of the TPB have also been emphasized. For instance, by introducing behavioural intentions as a predictor of actual behaviour, the TPB is restricted to behaviours that are under the volitional control of the individual (Burton, 2004). In other words, this model is relevant for types of behaviours that farmers consciously wish to enact. Neuroeconomics and behavioural economics can then contribute to develop this behavioural model by introducing "background factors" (Ajzen, 2020) to the model that belong outside of farmers' awareness, to predict their economic choices, such as habits, bias or emotions. Agricultural economists could then assess which types of psychological constructs are the most relevant to predict farmers' actual behaviour, depending on farmers types of economic choices. Investigation of potential mediator effects of the TPB factors, predicted by unconscious psychological variables, can also be a way forward for improving the explanatory power of the model. Another criticism given to the model has been the lack of integration of economic and contextual factors in the influence of farmers' behaviours. However, the TPB is flexible enough to overcome this critique as "in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the theory's current variables have been taken into account." (Ajzen, 1991). In paper IV, we consider this last

criticism and use this flexibility by applying and augmenting the TPB with a construct that consider farmers' interactions with their environment and deemed to play a role in their adoption decision, network memberships. We also add psychological constructs that include some economic aspects: economic identity, perceived economic benefits and perceived labour constraints. As we explain in the results of our paper, this study may also support the common criticism given to the model in relation to the well-known intention-behaviour "gap".

3. Methodology and data

3.1 Mixed research methods

Since my thesis is concerned with farmers' choices and decision-making, which is considered as a social phenomenon, studying this topic with a mixed-methods approach appears essential to better understand the individual and social components which can be explored with both qualitative and quantitative methods. Human behaviours are complex social phenomena which cannot solely be understood with a mono-method approach (Tashakkori & Teddlie, 2003; Goerres & Prinzen, 2012). The prevalent quantitative research in economics is today questioned in the academic debate, given the important human factor in that field (Jemna, 2016). In economics, quantitative and qualitative methods are usually seen as either analysing numbers with statistical or econometrics methods versus using verbal data and analysing it in some other way. Starr, (2014) questions this dichotomy by explaining that verbal data can be analysed or converted in quantitative ways or that quantitative evidence can be analysed narratively. She suggests that, a better way to define these two types of methods is to see them as closed vs. open-end approaches for gathering data. More precisely, with quantitative methods, researchers need to predefine the types of variables to collect and to subsequently be tested while, with qualitative methods, there is the opportunity to be more flexible when gathering information through deeper discussions with respondents. The main contribution of this thesis is to combine analyses that zoom in, by having a closer look at how farmers reasoned through in depth-interviews (Paper II) and zoom out, by providing a broader overview on how farmers'

behaviour can be understood with predefined theories, which were tested with survey data (Paper IV).

As both qualitative and quantitative methods have their strengths and weaknesses, adopting a mixed research methods design, which combines the two, allows to mitigate their inherent limitations. In empirical work, qualitative methods can allow for richer, more nuanced and more complex understanding of individual's decision-making which is more difficult to aim with quantitative methods, while quantitative methods allow for prediction of individuals' behaviour and external validity, where qualitative approach limits this possibility. Furthermore, while contextual information is better grasped with qualitative data than quantitative data, subjectivity is one weakness that is often emphasized from analysing qualitative data and that researchers should be aware of. However, Paper I and Paper II of this thesis aimed to mitigate this weakness through cross-checking reliability (see section 3.3).

While quantitative and qualitative approaches depart from different epistemological and ontological considerations and are often opposed for that reason, they both can be useful to contribute to the state of knowledge in economics (Jemna, 2016). In this thesis, the qualitative data and methods from Paper I and II help to understand mechanisms, the "how" questions although since these papers involve some quantitative analysis of the data, they also answer some "what" or "how much" questions. Paper III also adopts a mixed approach and gives insights on "what", "how much" and "how" questions. On the other hand, Paper IV which implements quantitative methods, contributes to the "what" questions of the thesis, although Paper IV also explores mechanisms in addition to direct effects and therefore also tackles some "how" questions.

As Creswell, (1994) suggests, mixed methods can be used with a *sequential strategy*, where findings from applying one method are elaborated or expanded with another type of method. Conversely, my thesis rather adopts a *concurrent mixed methods strategy* as it merges both quantitative and qualitative data to provide an overall analysis of the research topic. In fact, each behavioural factor or factors from papers I, II and IV were studied independently and analysed with a suitable type of method and data to answer the research question. In other words, most papers composing this thesis were not developed sequentially based on the findings of the others,

except for paper III and paper IV as the results of the systematic map led me to investigate a specific psychological factor, farmers' identity.

Paper I adopts a mixed-method approach as qualitative data, policy documents, were collected, but it was analysed with a quantitative approach, deductive content analysis. Similarly, Paper II also adopts a mixed research methods approach as data were collected through a qualitative technique with in-depth, laddering interviews and then were analysed with both deductive and inductive coding. Deductive coding involves coding text within a pre-defined list of codes, usually defined from theory, while inductive coding involves developing codes directly from the text or data, which more loyally reflect what is actually expressed. Furthermore, data were as well represented with quantitative techniques for further analysis and interpretation of results. Similarly, Paper III carries a systematic map with both a quantitative and qualitative analysis of qualitative data. Finally, quantitative methods of factor analysis and logit regressions are carried in Paper IV.

While qualitative data were collected for Paper I and Paper II, as explained above, it were analysed with deductive approaches, which brings me closer to the methodological considerations of the philosophy of positivism and its alignment with the hypothetico-deductive model (Park et al., 2020). My ontological considerations, as a researcher, are also in line with the positivist philosophy, and more precisely, the ontology of realism, as I believe that reality exists and that it can be understood, identified and measured. However, I do not believe that the results of Paper I and Paper II in my thesis are completely devoid of subjectivity and researchers' interpretation, which in this case, reveals that my epistemological positions differ from positivism. In fact, positivism considers that knowledge should be produced objectively, without researchers' values influencing its development as the researcher and the research object should not interact (also known as "dualism") (Park et al., 2020). Furthermore, in contrary to the epistemological positions of positivism, I do value and consider the importance of contextual factors in Paper I and Paper II to understand the whole picture of the phenomena being studied. As for Paper III and Paper IV, they more holistically fit within the positivist philosophy. All in all, this thesis can be rooted within the epistemological foundations of Deweyan pragmatism (Biesta, 2015), which rejects the forced division between subjectivism and objectivism and emphasizes that knowledge can be both

developed independently from the researcher but also contains some subjective elements. This coalition is made possible by understanding Dewey's views on how knowledge is produced which is both constructed and real. As Biesta, (2015) explains, Dewey's position can be called a form of "transactional realism", as it is not only about understanding the reality as it is presented to us, but also understanding it with conditions and consequences of actions which comes from thinking and reflection, as we research this reality. Deweyan pragmatism appears as a useful framework for social and behavioural research implementing mixed research methods (Biesta, 2015).

3.2 Data

The empirical material of this thesis was collected independently for each paper and is constituted of both quantitative and qualitative data, which reflects the mixed-method approach of the thesis.

3.2.1 Qualitative data

The first empirical study of this thesis is based on policy documents of Rural Development Programmes (RDPs), collected for three CAP periods and in six EU member states and regions. More precisely, this includes: i) RDPs for the CAP 2000-2006 of Sweden, France and Bavaria and the RDPs for the CAP 2004-2006 of Hungary and Poland, who joined the EU in 2004; ii) RDPs for the CAP 2007-2013 of the same previously mentioned EU member states and regions as well as Romania who joined the EU in 2007; iii) RDPs for the CAP 2014-2020 of all six selected EU member states and regions. The sample is therefore constituted of a total of 17 policy documents and the entire RDP was considered for coding in the analysis. Each case study team of researcher was responsible for collecting their own RDPs.

Laddering interviews, which are in-depth types of interviews, constitute the data of Paper II. Interviews were carried with farmers with certified organic production and farmers with conventional production, in France, Sweden and Ireland. More precisely, interviews were carried through phone, face to face meetings and phone, video meetings in Sweden, France and Ireland respectively. Some descriptive statistics about the respondents were also collected by directly asking respondents. Interviewers carried the

interviews in the national language of farmers and were then translated from original language to English in the case of Sweden and France. The organic and conventional farms were sampled through non-proportional type of sampling in Sweden and Ireland, such that both mixed farming and livestock farms were included in similar proportions and selected such that to achieve a diverse regional distribution. In France, mixed farming farms were targeted and collected for the sub-region Puy-de-Dôme. In our sample, organic farms are in rather same proportions in Sweden and Ireland, except in France where mixed farming farms are relatively more important than livestock farms (found *a posteriori* to not be mixed farming farms), while livestock farms are relatively more important for conventional farms, in Sweden and Ireland, except for the French conventional sample which is constituted of mixed farming farms only. In total, the sample is composed of 40 organic farms including 19 interviews from Sweden, 15 from Ireland and 6 from France; and 38 conventional farms including 20 interviews from Sweden, 13 from Ireland and 5 from France.

Paper III relies on information gathered through a systematic literature map. The literature search was undertaken by running our search string in the databases of Web of Science and Scopus. The final set of mapped studies is constituted of a sample of 70 peer-reviewed articles, published during the period of 2010-2022, which are quantitative studies investigating factors influencing farmers' adoption of ecological practices. After this selection of articles which was based on inclusion and exclusion criteria, we extracted different types of information and mapped studies along i) the types of ecological practices adopted ii) the frequency of inclusion and significance of five categories of independent variables and iii) how the dependent variable of adoption was measured. This overview was supplemented with a qualitative assessment of the collected literature.

3.2.2 Quantitative data

Furthermore, Paper IV complements this above mentioned qualitative material with quantitative data collected through an online survey. While the questionnaire should be considered as secondary material as it was elaborated by the Low-Input Farming and Territories (LIFT⁴) project (Tzouramani et al., 2019), the survey data is primary data. Especially, we

⁴ <https://www.lift-h2020.eu/>

targeted farmers specialized in dairy, sheep, cattle, livestock or mixed livestock, commercial farms with sufficient amount of activity (more than 1600 working hours) and stratified with relatively more farms randomly drawn from areas of South and Middle Sweden than the North, to better account for the regional dispersion of the Swedish farming activity. We contacted farmers through an invitation letter sent by post, explaining the purpose of the study, that their answers would be kept anonymously, how to complete the questionnaire online and the possibility to obtain a summary of the analysis after fully completing the questionnaire. Addresses and contact details were retrieved from Statistics Sweden and three electronic reminders were sent through emails and text messages. We obtained a total of 387 fully answered questionnaires, corresponding to a 19% response rate.

3.3 Review of empirical material and research quality

The above described data and mixed research methods approach of this thesis result into a diverse empirical dataset which was analysed with motivated methods. An overview of the data and applied methods are presented in Table 4 below. I then subsequently discuss the quality and possible limitations of this material and methods.

Table 4. Overview of empirical material and methods applied

	Paper I	Paper II	Paper III	Paper IV
Collected data	Policy documents	In-depth laddering interviews	Scientific articles (primary research)	Survey
Analytical approach	Deductive content analysis	Means-end chain approach and Hierarchical Value Maps	Systematic map and qualitative assessment	Factor analysis and logit regressions
Type of methodology	Deductive Mixed methods approach	Both inductive and deductive Mixed methods approach	Deductive Mixed methods approach	Deductive Quantitative

	Paper I	Paper II	Paper III	Paper IV
Sample	17 policy documents: 3 RDPs from Sweden, France, Bavaria, Poland, Hungary and 2 from Romania	40 organic farms and 38 conventional farms or 11 French farms, 39 Swedish farms and	70 quantitative peer-reviewed empirical articles	387 farms
Type of material	Qualitative	Qualitative	Qualitative	Quantitative

To discuss the quality of the qualitative material of this thesis, together with its analysis, I use the distinctive notions of descriptive validity, interpretative validity, theoretical validity and generalizability of Maxwell, (1992). As the qualitative data of this thesis were collected from different countries and then analysed and compared, the question of language is central to evaluate descriptive validity. In Paper I, RDPs were analysed in the original language by researchers who were fluent in this language. Furthermore, clear instructions were given to coders to select the appropriate information. Similarly in Paper II, descriptive validity was ensured by carrying in-depth interviews by researchers whose mother tongue was the one of the interviewees. The interviews were not recorded and transcribed but essential responses for the laddering technique were written down and stored by interviewers. I ensured descriptive validity by requiring that interviewers went through the ladders with each interviewee at the end of the interview, to double-check for any misunderstanding. Interviews were then translated to English, in the case of French and Swedish interviews, for coding purposes. In this process, accuracy of verbal meanings might have been lost. However, as French is my mother tongue and I do have a good understanding of Swedish, I also read the interviews in the original language when coding the text in order to keep the authenticity of meanings as much as possible. Interpretative validity was pursued in Paper I by carrying a cross-check of results in each country case team and, in Paper II, by checking for inter-coder reliability and revising the codes until reaching a satisfactory threshold of inter-coder reliability index. Theoretical validity was sought by clearly defining theoretical concepts in Paper I, II and III for all researchers involved in the analysis. For Paper I, I distributed a literature review on

policy discourses that were going to be applied in the analysis, and I provided a list of themes for each discourse to be commonly used for coding. For Paper II, I circulated a list of master codes and their definitions to all researchers involved both in the inter-coder reliability and researchers who were not involved, but had been involved in the data collection, to ask for feedback. For Paper III, independent variables and ecological approaches, along which scientific articles were mapped, were defined based on previous reviews or theoretical papers. As for generalizability, external validity was not the aim of Paper I and II and our findings are specific to our sampled population. In fact, qualitative research usually does not aim for generalizability but transferability, where results can be “transferred” to similar contexts and settings (Tracy, 2010). For transferability of the results of Paper I and II, I aimed to provide sufficient contextual information for each country case study in Paper I and descriptive statistics of the sampled farms in Paper II. However, further descriptive statistics could have been commonly collected in Paper II such as farmers’ age, to help for further contextualization, and therefore transferability.

In regard to the pure quantitative approach taken in Paper IV, data collection, analysis and findings can be discussed in terms of internal and external validity. Internal validity of the questionnaire, which is a shortened version of the questionnaire elaborated by the Low-Input Farming and Territories (LIFT) project (Tzouramani et al., 2019), was considered by discussing the questionnaire in regard to Swedish specificities with colleagues at the department and those from a research company who administered the questionnaire. However, pre-testing the questionnaire by discussing the formulations of questions with Swedish farmers was limited in our case as questions could not be edited, as we had to follow specific reporting procedure for the LIFT project, since the survey aimed to be conducted in a number of countries of the project (Tzouramani et al., 2019). This questionnaire was nevertheless an opportunity to test the relationships we were interested in, with regard to psychological constructs that could explain farmers’ adoption. Quality of measurement of our constructs was considered by assessing construct validity and construct reliability. More precisely, construct validity which is the extent whether items correctly represent the latent, was checked in terms of both convergent validity, safeguarded by high factor loadings and discriminant validity, safeguarded by absence of cross-loadings, meaning that constructs are distinct from each

other. Reliability, which assess the degree of consistency between measurements or items, was checked with different coefficients. As for external validity, or whether we can generalize the findings of our study to other situations, people and settings, our results can be generalized for the type of population we targeted, which are Swedish farmers specialized in livestock production. Non-parametric statistical tests comparing the means of the analysed sample and the target population, supports the representativeness of the analysed sample except in regard to targeted geography as the sample reveals to be biased towards Northern Sweden, with 7 percentage points difference. This bias should nevertheless not be of a major issue for the results of the analysis as the analysed sample and targeted farmers from the North and the South do not statistically differ in terms of farm specialization. Furthermore, when controlling for Region, this variable appears not statistically significant which indicates that results should not substantially be impacted by this bias.

4. Summaries of appended papers

This chapter provides a summary of each of the four papers included in this doctoral thesis.

4.1 I- How are ecological approaches justified in European rural development policy? Evidence from a content analysis of CAP and rural development discourses

In the first appended paper of this thesis, we analyse the types of policy discourses that are being used in Rural Development Programmes (RDPs) of six EU member states and regions, to depict and justify the support of ecological approaches, across three programming periods of the Common Agricultural Policy (CAP). The use of discourse analysis aimed to understand the policy justifications that were associated with ecological approaches and especially, the types of public goods that were promoted for implementing these approaches. Furthermore, it was assumed that differences in RDPs' policy measures promoting ecological practices across EU member states originated from differences in societal understanding of externalities in agriculture. This study therefore also revealed differences and similarities of societal views about ecological approaches among the studied EU member states and regions, as well as the type of ecological approaches that were recognized at national policy level.

On the one hand, the agricultural policy (or CAP) discourse and its evolution have been studied within the political science literature, mainly from Commissioner's speeches and other types of policy documents (Clark et al., 1997; Potter & Tilzey, 2005; Potter, 2006; Erjavec et al., 2009; Erjavec &

Erjavec, 2015; Alons, 2017). On the other hand, the rural studies literature provides another theoretical lens about views and opinions on the process and outcomes of rural development, which are expressed through socio-political discourses of RD (Hoggart et al., 1995; Frouws, 1998; Elands & Wiersum, 2001). However, while ecological approaches are gaining increasing interest at the European level (European Commission, 2019), this literature have not yet considered how these approaches are integrated within the agricultural (or CAP) and RD policy discourses.

Therefore, this paper investigates: How are ecological approaches justified in European rural development policy? Especially, what types of dominant discourses appear in the policy documents of RDPs, when associated with ecological approaches? Do we observe geographical differences in terms of promoted public goods, across member states and regions, when referring to ecological approaches? What discourse prevails in different CAP periods and do we observe temporal trends? To what extent have ecological approaches been emphasized in RDPs? In doing so, this paper develops a conceptual framework integrating both CAP and RD discourses and applies it with a deductive content analysis focused on the policy documents of RDPs. We follow the classification system of Rega et al., (2018) to categorize ecological approaches across five farming systems: agroecology, organic farming, integrated farming, low-input farming and conservation agriculture. Our data comprise RDPs for the 2000–2006 CAP period in Sweden, France and Bavaria, as well as in Hungary and Poland, which joined the EU in 2004; for the 2007–2013 CAP period in the same member states and regions, as well as Romania, which joined in 2007; and, finally, for the 2014–2020 CAP period in all six member states and regions.

Overall, results indicate that ecological approaches are mostly promoted within a multifunctional discourse and more precisely, promoted as providing the public goods of biodiversity (nature conservation discourse), the protection of the environment and traditional modes of production (agriruralist discourse). Neomercantilism appears as the third dominant discourse in the two last CAP periods (2007-2014 and 2014-2021). Furthermore, the absence of the CAP neoliberal discourse within the RDPs shows that these approaches are advocated as serving most and foremost national interests instead of being promoted on external markets. Agroforestry together with biodiversity-based and organic farming are the most frequently mentioned farming systems from the policy documents. In regard to temporal and

geographical comparisons, we find that the nature conservation discourse is mostly characteristic of France and Bavaria, while not so much present in Sweden, where agri-ruralism instead dominates. As for neomercantilism, this discourse was mostly used in Sweden and Poland, when justifying the support of ecological practices. Over time, we notice an increase of the use of the nature conservation discourse between the 2000-2013 and 2014-2020 CAP periods, except in Sweden. In contrast, the use of agri-ruralism decreased in RDP policy documents in these last two periods, except in Sweden. We also observe an increasing trend of the neomercantilist discourse in the two last CAP periods, in all member states and regions, except in Sweden where the increase is mostly noticeable between the first and last periods. Finally, by using the quantitative feature of deductive content analysis, we find that, in their respective RDPs, Poland and Romania have increasingly considered the support of ecological approaches.

This study makes two explicit contributions to the literature. First, it is one of the first attempts to focus on how policy discourse integrates ecological approaches by using a broad typology of ecological farming systems. Second, it contributes to the lack of geographical comparison in national discourses related to rural development policy by contrasting them in a set of different EU member states and regions. Our findings highlight that these six EU member states and regions recognize the potential of these approaches for delivering public goods, despite a lesser emphasis on socio-economic benefits. The type of public goods identified from this analysis, as policy justifications for ecological approaches, could be used to justify supporting a larger set of ecological farming systems besides organic farming, and therefore contributing to the further development of ecological agriculture.

4.2 II – Farmers’ perceived values in conventional and organic farming: a comparison between French, Irish and Swedish farmers using the Means-end chain approach

This second paper of the thesis explores and compares the types of values, economic and other, that motivate certified organic and conventional farmers in their choice of farming system. Comparison of farmers’ values is also

carried across three EU countries: France, Ireland and Sweden. For Gasson (1973), personal goals and values are one facet of psychological motivations that drive farmers' decision and economic behaviour. With the ambition of the Farm to Fork Strategy of the European Green Deal to reach 25% of EU's agricultural land under certified organic farming by 2030 (European Commission, 2020), values appear as potential levers to incentivize conversion from conventional to organic. Furthermore, both pecuniary and non-pecuniary types of benefits are deemed important in the influence of farmers' activities (Howley, 2015). The contribution of this paper is to uncover both pecuniary and non-pecuniary values that may motivate farmers' choice of production system, which is a stepping stone to more efficient design of incentives that support a higher uptake of organic farming.

Accordingly, this study inquires: what underlying values drive farmers' decision to run either a conventional or an organic farm? For this purpose, the paper investigates farmers' decision-making through mind-maps, or so called Hierarchical Value Maps (HVM). More precisely, we analyse and compare attribute-consequence-value representations of the choice of production systems among farmers, using a Means-end chain (MEC) approach (Gutman, 1982) and in-depth laddering interviews (Reynolds & Gutman, 1988). The uncovered values were then classified along the Rokeach (1973)'s typological framework to distinguish between instrumental and terminal types of values. This typology was selected to understand if farmers are in a state they prefer to remain, or in state that aims to achieve something else in the future. Furthermore, to discuss the results on instrumental values and consequences, we distinguish between financial business or productivity (FBP) and non-financial business or productivity types (non-FBP) of values, which we specifically define and use for this analysis.

The data is comprised of a total of seventy-eight interviews. Our sample is composed of 40 organic farms including 19 interviews from Sweden, 15 from Ireland and 6 from France; and 38 conventional farms including 20 interviews from Sweden, 13 from Ireland and 5 from France. With this material, we were able to generate a total of six HVMs which were compared across farming systems and country case studies.

As for our overall results, we discuss them first in regard to identified consequences and instrumental values and second, in regard to identified terminal values. Concerning consequences and instrumental values, results

indicate that both FPB values and non-FPB values drive conventional and organic farmers' decision. Respondents with organic production value, for instance, "maintaining the business" or "earning a living" which are FPB types of values but also more social motives (non-FPB) such as "care for others" or "prove the value of organic farming". Similarly, respondents with conventional production are motivated by non-FPB values such as "preserving traditions", "morality" and "responsibility" but also FPB values such as "taking up a challenge". With regard to terminal values, results indicate that respondents with certified organic production have more socially preferable end-states of existence, while the end-states of existence are relatively more self-oriented amongst farmers with conventional production. Furthermore, HVMS show that respondents with certified organic production, in the case of Sweden and Ireland, display more complex train of thoughts with long chains of different motives and, sometimes, circular chains. This suggests that respondents running a certified organic farm are more reflective on their activity and, potentially, perceive their production system as a more complex system, involving multiple interconnections within nature and how it interacts with farming practices. This circularity of MEC elements observed in our data, together with some reversed structure of these elements, points out the limitation of the MEC approach assuming a linear relationship from attributes (A) to consequences (C), and consequences to values (V). Finally, we find that, all countries considered, respondents with conventional production have 1.5 times more instrumental values than terminal values in comparison to respondents with certified organic production for whom the ratio is of 1.1. As I discussed in chapter 2, section 2.2.2, this might reveal that conventional farmers are relatively more driven by business types of values rather than personal types of values, when carrying their activities.

As for our cross-country comparison, we find some differences and similarities. Irish respondents emphasized the importance of "life quality" and "lifestyle" as a terminal value, both in the conventional and organic case. Rationales based on "preserving traditions" or "to transmit" were characteristic of the Irish respondents with conventional production. In comparison to the French and Swedish case, Irish respondents with organic production are not so much driven by social types of terminal values. For French respondents, "social recognition" appears as a central terminal value in both types of farming system while it is the concept of (personal)

“security” that drive both types of respondents in the Swedish case. The consequence of “ensuring production” is one rationale that centre the reasoning of both French and Swedish respondents with conventional production.

Our study makes several contributions to the literature. First, it contributes to the literature looking at farmers’ values as a driving factor for farmers’ decision-making and choices (Gasson, 1973; Willock et al., 1999; Maybery et al., 2005; Ferguson & Hansson, 2013 Vänninen et al., 2009; Lagerkvist et al., 2012; Barnes et al., 2011; Hansson & Lagerkvist, 2015; McInerney, 2004), with qualitative methods. Specifically, it is the first to implement the MEC approach to study farmers’ decision-making in deciding whether to run a conventional or a certified organic farm. Second, the cross-country comparison analysis contributes to the understanding of how farmers’ values or reasoning may vary or resemble across country case study areas. Third, our result on circularity of MEC elements has implications for future research, which have the important task of furthering the understanding about the lack of human cognitive structure based on concreteness-abstraction dimensions, assumed by the MEC theory. Finally, this paper makes a theoretical contribution in regard to conceptualisation of values. Our novel distinction between FPB and non-FPB can be used in subsequent research as a theoretical framework to classify values.

Our findings are important for policy for several reasons. First, the identified values and consequences can be of use for farmer advisors and policy-makers to support a targeted communication concerning these production systems. This would include the promotion of perceived benefits of organic farming which are here both FPB and non-FPB, self-oriented and socially oriented. Our results imply that these can be mirrored with conventional farming, in order to encourage conventional farmers to make the switch. Second, the socially-oriented revealed values (e.g. societal health) that are relatively of greater importance among certified organic farms, can be used in food awareness campaigns to drive consumers’ behaviour. Finally, the cross-country comparison analysis of this study can be used to adapt such communication to country specificities.

4.3 III – Farmers’ adoption of ecological practices: a systematic literature map

This paper synthesizes, structures and compares evidence from the quantitative literature investigating adoption of ecological farming practices, between 2010 and 2022. In comparison to systematic reviews which aim to answer a specific research question, which is usually closed-framed, systematic maps rather aim to describe and catalogue the state of knowledge (e.g. through identified clusters) of a topic or question of interest that can be open or closed-framed (James et al., 2016). In fact, this study aims to answer a rather broad research question and we gather broad evidence on this research topic, in regard to what is driving adoption, not just one or two driving factors (Peterson et al., 2017). Specifically, in this analysis, we map quantitative observational studies in terms of types of ecological practices adopted, frequency of inclusion and significance of five categories of independent variables and how the dependent variable of adoption was measured. For this purpose, we develop a search string, to identify our population, intervention, comparison and outcome (PICO), based on previous reviews focused on farmers’ adoption literature and the study of Rega et al., (2018) which identified a classification of ecological farm types. This query was then run in the databases of Web of Science and Scopus. We then screened the abstract and titles of records by applying a set of exclusion criteria before carrying a deeper screening during which we extracted, among others, information about the construction of the dependent variable and the types of independent variables measured. Especially, independent variables were categorized into behavioural, social, formal institutional, farm structural and socio-demographic factors. A total of 70 articles that investigated factors affecting the voluntary adoption of ecological practices were retained for the systematic map. Finally, we carried a qualitative assessment of the mapped studies.

This systematic map reveals that socio-demographic and farm structural types of variables have more extensively been studied in the mapped literature, while our results suggest that they were more often insignificant than significant. In contrast, behavioural, social and formal institutional factors received relatively less attention as they were relatively less frequently tested. In regard to behavioural factors, we find stronger evidence for cognitive or proximal attitudinal variables compared to dispositional attitudinal variables. In terms of significance, proximal attitudinal variables

were slightly more often significant (in nearly 75% of tested models) than dispositional attitudinal variables (50% of tested models). Whilst evidence on social factors is lacking, we notice a growing interest in regard to social norms and identity, which appear significant in at least 50% of tested models. We do not however find clear temporal patterns of evidence concerning other independent variables, except for the formal institutional factor of finance, which have been studied less and less over time. Finally, fertilization and soil management together with precision technologies are the most commonly tested practices, organic farming coming third.

Several implications for future research can be drawn from this study. First, our result on the evidence in regard to the scope of farming practices studied in the literature points out the need for more investigation of factors of adoption for other ecological farming systems than organic farming. In particular, future research could aim to understand whether drivers differ between wide-changes at the farm level (e.g. adoption of agroecology) versus adoption of single practices. Second, besides further research needed in regard to behavioural, social and formal institutional factors, we call for a better use of behavioural models and collection of psychometric data, as they were only applied in the last years of our mapped sample and we observe a reliance of census data (mostly studies from USA). Finally, as our quality assessment reveals, the lack of use of multi-criteria measurement for psychological constructs underline the need to develop more reliable constructs for general attitudes and beliefs.

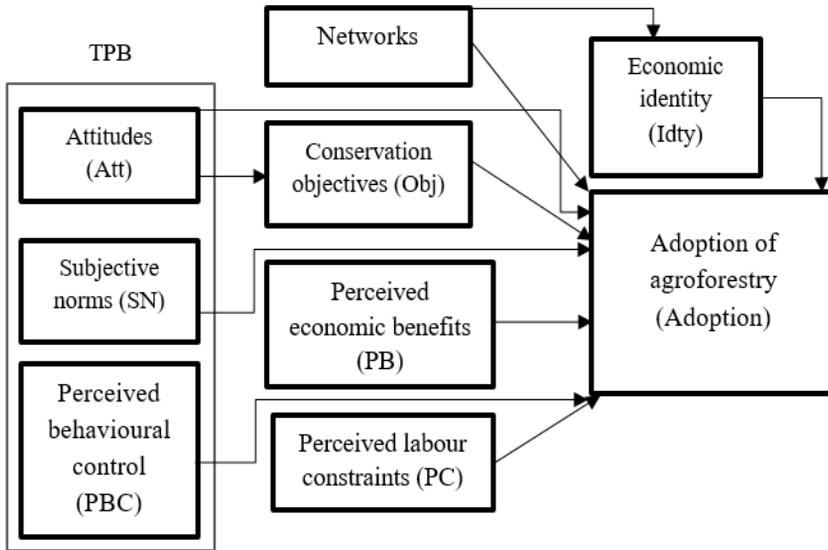
As for policy implications, our study points out that the mapped literature have found that adoption is driven by the perception of more general benefits and not only financial ones. Policy should therefore consider these other types of motivations for more efficient design of incentives of adoption. Furthermore, as our mapping indicates the importance of farm type, land type and practice compatibility for adoption, policy-makers should consider differentiating farms with such structural conditions in order to facilitate uptake of adoption of these practices. Finally, our findings point out the questionable efficiency of AES for farmers' adoption.

4.4 IV – Investigating farmers’ behavioural drivers for adopting agroforestry practices – An extended theory of planned behaviour model

This last appended paper investigates the role of a set of behavioural factors on farmers’ adoption of agroforestry practices, in a Swedish context. Agroforestry corresponds to the practice of integrated land management with trees and shrubs together with crops and/ or livestock in order to benefit from economic and ecological interactions (Burgess & Rosati, 2018). These practices have been advocated as supporting a range of public goods (Smith et al., 2021) which have potential for fostering sustainable rural development in the EU. Furthermore, the CAP has shown its increasing interest to reward agroforestry through a succession of various policy measures (Lampkin et al., 2020; Laporta et al., 2021). In particular, the review of Dessart et al., (2019) highlights the importance to consider behavioural factors for understanding farmers’ adoption of ecological practices and, subsequently, designing more credible and effective agri-environmental policy.

Therefore, this paper aims to understand how behavioural factors impact farmers’ adoption of agroforestry practices. For this purpose, our conceptual framework augments the Theory of Planned Behaviour (TPB) by adding the behavioural factors of farmers’ economic identity, network memberships, conservation objectives, perceived economic benefits and perceived labour work constraints. In this way, this paper also investigate whether these additional constructs improve the explanatory power of the TPB, in a stepwise manner. Especially, the psychological construct of identity has only been recently studied in the literature of farmers’ adoption of ecological practices (Burton, 2004, Lokhorst et al., 2011; McGuire et al., 2013; van Dijk et al., 2015, Borremans et al., 2016 ; Inman et al., 2018 ; Valizadeh et al., 2020 ; Cullen et al., 2020; Zemo & Termansen, 2021). This study therefore contributes to this emerging literature and it is, to our knowledge, the first to study the impact of identity on the actual adoption of agroforestry, in a European context. More precisely, economic identity is measured by integrating the “entrepreneur”, “producer” and “professional” types of identity, which, to our knowledge, have not been measured as an overall construct for predicting adoption of ecological practices. Furthermore, our model investigates two additional mediation effects (see Figure 4).

Figure 4. Conceptual framework



This study is based on Swedish agricultural data collected through an internet-based survey. Factor analysis and logit regressions were implemented to, respectively, measure our latents and estimate our models. More precisely, we carried a factor analysis for all constructs except for network memberships which was carried with principal component analysis. Factor scores were then extracted before being included as predictors in binary logistic regressions.

The findings indicate that farmers' memberships and frequency of involvement into farmers' organizations, union and/or landowners' association have a significant positive impact on their uptake of agroforestry. Furthermore, adding on the Networks variable to the TPB provides a significant improvement to the adoption model. This result highlights, as Castillo et al., (2021) mentions, the importance to include exogenous types of factors to the TPB, which solely focuses on cognitive factors, as farmers' interactions with their community appear as an important motivation in their adoption behaviour, in our case, for agroforestry adoption. One main policy implication can be drawn from this finding. It highlights the importance to facilitate and encourage farmers to connect to these types of formal networks. Agricultural advisors involved in these networks could facilitate

learning and spread of knowledge by organizing workshops focused on agroforestry techniques.

We also find that, in our case, economic identity does not significantly affect farmers' adoption of agroforestry. We are therefore not able to confirm the hypothesis that identifying oneself with either the "entrepreneur", "producer" or "professional" roles as a farmer is detrimental for farmers' adoption of agroforestry practices.

Our results also indicate that the TPB variables do not significantly predict adoption of agroforestry and that the model itself is not significant. This may support the often discussed criticism given to the model in the literature in relation to the behaviour-intention "gap".

5. Concluding discussion

This chapter discusses the contributions of the thesis in regard to the three broad research questions stated in the introduction before providing recommendations to different stakeholders and suggestions for future research.

5.1 Contributions

This thesis, rooted in agricultural economics, addresses interdisciplinary research for exploring three main types of factors shaping farmers' choice to uptake ecological approaches. It generally contributes to the literature on farmers incentives for adopting these approaches, and more specifically, to literature focused on behavioural, psychological factors. It therefore contributes to scientific literature within agricultural economics and behavioural economics by borrowing theories from the fields of psychology and sociology. While the primary aim of Paper I was not to investigate drivers of farmers' adoption but rather, how policy-makers communicate and justify the support of these approaches, its contributions can be indirectly linked to behavioural factors and farmers' uptake, which are discussed below.

- *What types of individual factors influence farmers' adoption of ecological approaches and how do they influence it?*

Within this category of factors, I distinguish between *cognitive* and *dispositional* factors. While *cognitive* factors do not consistently refer to same behavioural factors in the agricultural economics literature, I here use the definition of Dessart et al., (2019) who define them as psychological factors that refer to learning and reasoning, which includes farmers'

perceptions of relative benefits, costs and risks associated with a particular farming practice, or whether they feel they are skilled enough to adopt this practice. In contrast, Dessart et al., (2019) define as *dispositional* types of factors, factors that are relatively more stable, internal to individuals such as personality, motivations, values, beliefs, general objectives. They are said to influence not only the adoption of specific ecological approaches but other types of farmers' behaviours.

To answer the “what” part of the question, Paper III contributes by mapping the literature on individual factors (in the paper, referred as behavioural) affecting farmers' adoption of ecological approaches, in terms of inclusion and significance. We find stronger evidence for *cognitive* factors compared to *dispositional* factors. *Cognitive* factors mapped from the review of the literature include: perceived behavioural control (PBC), attitudes towards the practices such as perceived environmental benefits, financial benefits or general benefits, perceived ease of use while *dispositional* factors include risk attitudes, attitudes towards the environment and farmers' objectives. In terms of significance, cognitive factors were slightly more often significant (in nearly 75% of tested models) than dispositional factors (50% of tested models). It also shows that financial attitudes were highly tested in models but not as often significant as general attitudes, composed of other benefits than financial ones. This paper sheds light on the types of behavioural factors that seem to have an effect on adoption of ecological approaches, in the quantitative literature, but also highlights some research gaps that are discussed in section 5.3.

Paper II explores the *dispositional* types of individual factors by uncovering the types of values that drive farmers to adopt a conventional or certified organic farming system. It therefore answers the “what” part of the question by showing that both types of farmers are driven by FPB and non-FPB types of values, although respondents with a certified organic farm display a wider range of FBP motives and vice versa for conventional farms. In regard to terminal values, farmers with organic production are relatively more driven by socially-oriented final state of existence and vice versa for conventional farmers. Besides empirical contributions on *dispositional* types of individual factors, Paper II also makes a theoretical contribution to the literature by introducing two new categories of farmers' values: FPB and non-FPB types of values that were inductively defined from our analysis. This analysis also contributes to answering the “how” part of the question by

analysing decision-making of both types of farmers, through mind maps or Hierarchical Value Maps (HVM). In this regard, the mind maps analyses instead uncover the more *cognitive* aspects influencing farmers' choices as it depicts their reasoning, how they justified their choice of production system and farming practices. This contribution is given by the powerful tool of the MEC approach linking attributes, consequences and values. Except in France, the more complex structure of mind maps and laddering interviews for respondents with organic farms indicate that farmers with certified organic production are more reflective on their activity, perhaps because of the necessity to observe and use interactions from ecosystems when farming with organic farming practices.

Finally, Paper IV also contributes to the “what” part of the question by investigating the role of *cognitive* and *dispositional* factors for farmers' adoption of agroforestry practices. In regard to *cognitive* factors, these correspond to positive attitudes towards ecological approaches, perceived behavioural control, perceived economic benefits and perceived labour constraints of ecological approaches. In our case, *cognitive* factors do not have a statistically significant effect on adoption. Conservation objectives are studied as a *dispositional* type of factor and Paper IV further contributes to the “how” part of the question by investigating the effect of this construct as a mediator between attitudes and adoption. The results indicate that farmers' attitudes towards ecological approaches positively impact their conservation objectives which then lead to adoption, the direct link between attitudes and adoption not being originally statistically significant. However, the significance of the mechanism effect disappear after controlling for covariates.

- *What types of social factors influence farmers' adoption of ecological approaches and how do they influence it?*

Paper III of this thesis additionally mapped social types of factors affecting farmers' adoption of ecological approaches, in the quantitative literature. Results indicate that influence of media and identity are significant in at least 70% of models and influence of advisors and social norms in at least 50%, though they are tested in less than 20% of models. This points at the importance to consider societal influences in farmers' decision to adopt such approaches and probably the need to include such types of variables in

studies focused on economic modelling of decision-making. Especially, this paper revealed the lack of attention given to the psychological construct of identity as a driving factor for adoption, in the quantitative literature.

Based on this result, Paper IV contributes to this gap by exploring the role of farmers' economic identity on farmers' adoption of agroforestry practices, with quantitative methods. As identity is socially constructed, it also aimed to investigate the mechanism (the "how" question) through which economic identity is built, in this case, through interactions with formal networks including farmers' organizations, farmers' unions and landowners' associations. This paper also contributes to the literature investigating identity as a factor, in regard to its measurement, as we here include altogether the entrepreneur, professional and producer types of identities, which have not been sufficiently investigated in relation to adoption of ecological approaches. We do not find a significant impact of economic identity for adoption of agroforestry practices nor do we find a significant mediation effect of this variable on adoption. With this result, we are not able to confirm the hypothesis that seeing oneself as the archetypal "economic" farmer should be detrimental for adoption of agroforestry practices that are deemed beneficial for the environment and others, as generating public goods. However, given the point estimate and the relatively low standard errors for this variable, these results suggest that, if there was an effect, it would be small and most likely negligible. Furthermore, this paper also suggests a positive role of formal networks for farmers' adoption of agroforestry practices.

While Paper I did not directly investigate the impact of policy discourse on farmers' uptake of ecological approaches, it contributes, to some extent to the "how" part of this research question. In fact, through discourses about ecological approaches, policy-makers express what they believe is legitimate for agriculture to accomplish as roles for society and therefore, communicate the types of roles farmers should undertake for society. In relation to ecological approaches, results show that they are mainly advocated with the discourse of multifunctionality, as they should provide public goods in regard to biodiversity conservation (nature conservation discourse), preservation of the environment and cultural heritage conservation (agriruralist discourse). This indirectly can be paralleled with injunctive norms, from policy-makers, by requiring from farmers to provide these services. As self-identity is a socially constructed concept which "develops through

affirmation and reaffirmation in social discourse” (Burton & Wilson, 2006:105), this indirectly should develop or reinforce farmers’ multifunctional type of identity, where farmers see themselves not only as food producers for society but also as conservationists and agribusiness persons, which can help generating environmental, economic and social public goods in rural areas.

- *What types of material factors influence farmers’ adoption of ecological approaches and how do they influence it?*

The types of material factors influencing farmers’ adoption of ecological approaches are investigated in Paper III with formal institutional factors and farm structural factors. What Darnton & Evans, (2013) refer as “infrastructure” or “technology” types of factors are included as farm structural factors in our systematic map and our results suggest that land type, farm type and both infrastructural and practice compatibility seem to play a role for farmers’ adoption. However, except for AES, too little evidence found on formal institutional factors, that can be associated to “rules and regulations” or “infrastructure” in Darnton & Evans’s terminology, does not enable concluding on their importance. Nevertheless, results indicate that AES do not appear as an efficient tool for farmers’ adoption.

Paper IV’s results highlight the importance of landscape organization for farmers’ adoption. Farmers do not wish to adopt agroforestry practices if they have landscape features on their farms, which can be explained by their willingness to use the rest of fertile land for other purposes. Interestingly, farming practices that appear compatible with agroforestry, do not, in this case, positively but negatively influence adoption of similar practices.

Finally, Paper I, again, does not directly contribute to answering this last question but rather, provides information on “how” policy measures about ecological approaches (the legal framework which constitutes the material context, or layer), are promoted in the policy discourse. Understanding what rationales are put forward in EU member states and regions are important to understand how policy measures are communicated to farmers and other concerned agents. Through quantification of references to ecological approaches in RDPs, the results give insights about the attention given by member states and regions to these approaches, over three CAP periods.

Results point that, in the case of Poland and Romania, ecological approaches have gradually been more often mentioned over time.

This thesis, as a whole, highlights the importance to consider individual, social and material types of factors when investigating farmers' uptake of ecological approaches. Yet, the role of these factors may depend upon the types of approaches considered. In fact, in the case of agroforestry (Paper IV), for instance perceived economic benefits of ecological approaches do not have a statistically significant impact and our results of the systematic map indicate that they are significant in 50% of cases, without distinction of types of approaches. In contrast to agroforestry, in the case of organic farming, Paper II shows that interviewed farmers do perceive economic benefits from their choice of farming system such as the consequence of generating "profits" or "ensuring production".

5.2 Recommendations

Several recommendations can be drawn from this thesis. I discuss these messages as being addressed to different actors namely, policy-makers, advisors or other members of farmers' networks and stakeholders from the food industry.

5.2.1 For policy-makers

The first key message that can be useful for policy making is to consider that both financial and non-financial perceived benefits from adopting ecological approaches drive farmers' uptake. In this respect, while sufficient financial support is deemed important for farmers uptake, it is not the only leverage that can be used from policy as farmers are also motivated by lifestyle (e.g. health, leisure time), environmental (e.g. soil quality, biodiversity) and social (e.g. societal health, food security, consumer satisfaction, sense of community) benefits from adopting these practices. Hence, emphasizing these benefits when promoting these approaches, in the policy discourse, can help for better targeted communication, to which farmers can find more relatable. In fact, Paper I's results highlight that social types of public goods (which is for instance characteristic of the community sustainability discourse) are to a lesser extent promoted for supporting ecological approaches in RDPs. In contrast, results from Paper II and Paper III suggest that farmers recognize also social benefits from implementing ecological

approaches, and that it influences their choices. Paper II further highlights that respondents with both a conventional farming system and a certified organic farming system share FPB and non-FPB values, self-oriented and socially oriented state of existence. Our comparative results can be used such that organic farmers' motives can be mirrored with the ones of farmers with conventional production in order to incentivize them for transition. Furthermore, as we also show differences across a set of EU member states, the uncovered motives could be adapted for communication at national level. In regard to policy instruments for adoption, the questionable effectiveness of AES suggested by Paper III's results point at that financial reward for individual voluntary implementation of ecological approaches may not be sufficient.

Results from Paper I and Paper II are also useful for the possibility to push for uptake of a larger range of ecological approaches than organic farming per se. In fact, while our sample targeted certified organic producers in Paper II, ecological practices such as "less or no use of chemicals", "naturally raised animals" or "low-intensive system" were given as attributes from farmers for characterizing their choice of production. From the mind maps, these attributes can be traced to given rationales and motives that can be communicated for promoting these specific practices, which are also characteristic of other non-certified ecological farming systems, such as agroecology or conservation agriculture. Finally, the policy discourse analysis of Paper I provides information on the types of public goods that are attached to ecological approaches, through the identified categories of policy discourses. These promoted public goods (e.g. food security, cultural heritage with traditions, biodiversity, water preservation) can be used to justify a larger set of ecological approaches than organic farming.

5.2.2 For farmers' advisors and other members of formal networks

In a similar vein as it is discussed above for policy-makers, the identified values from Paper II can also be of use for better targeted communication from advisors to farmers with organic production and conventional production. Advisors can communicate the business values of organic farming, which may inspire farmers sharing similar values to consider organic farming as an alternative.

In regard to agroforestry practices, farmers' perceived benefits from Paper IV do not have a statistically significant effect but results indicate that farmers' interactions with formal networks, including farmers' associations, farmers' unions and landowners associations, are found to have a positive role for adoption. This indicates that diffusion of knowledge about these techniques, how to maximize the benefits and minimize the costs for instance, help farmers' adoption. Actors from these networks who can contribute to this process are multiple (advisors, other farmers, buyer representatives etc.) and more research is needed to understand what channels of communication provide useful information for incentivizing farmers' adoption of agroforestry practices. However, we can suggest that there is a role for farmers' advisors to better connect farmers to these networks and speeding knowledge and expertise about agroforestry in these respective networks. This could be achieved through for instance organization of workshops gathering both farmers using these techniques and farmers who express interest in using those.

5.2.3 For stakeholders from the food industry

Finally, results on perceived benefits and values from farmers with certified production who were interviewed in Paper II, can be utilized by stakeholders from the food industry including food labelling organisations such as KRAV in Sweden, Bord Bia in Ireland and AB in France. These results can help such actors understanding what motivated farmers who are certified to apply for their labels and, subsequently communicate farmers' rationales to better promote their certifications and associated labels. Furthermore, as various socially-oriented values were revealed from interviews with certified organic farmers, these can be communicated in food promotions campaigns to consumers who more and more value food that is produced with care towards the environment and society in general. Food campaigns can also underline the fact that farmers with certified organic production are driven by goals that align with the Farm to Fork strategy objectives (food security, sustainable production etc.).

5.3 Future research agenda

As exploring each layer of factors that drive farmers' adoption of ecological approaches is a wide, complex and ambitious research project, future

research is without doubt needed on that topic. Especially, results from Paper III give hints on the types of factors that have insufficiently been researched in the quantitative literature, especially *dispositional* behavioural types of factors, social and formal institutional factors. There is, in comparison, large amount of research on socio-demographic and farm structural factors while our results indicate that they do not seem to be playing a major role for adoption, except for farm type, land type and compatibility. Better exploitation of behavioural models and theories with further collection of psychometric data is suggested by Paper III. Results of Paper III can be further exploited by future research to decompose the role of factors by type of ecological approaches. Moreover, they can also be exploited for deeper analysis with a subsequent meta-analysis to better understand the direction of the identified significant effects from the literature.

Moving on to the why or how explanations that could be further explored in this thesis, I would first suggest future research to further investigate the complexity of relationship between farmers' identity and farmers' interactions with their social environment (sources of information, social norms, social discourse) and how these two contribute to the uptake of agroforestry practices specifically and ecological approaches in general. In regard to Paper IV, the feedback loop mechanism between farmers' identity and farmers' networks suggested by McGuire et al., (2013) could be explored with structural equation modelling techniques using non-recursive models. Qualitative research could also be used to deeper understand how farmers perceive themselves when transitioning from conventional approaches to ecological approaches. The study of Lähdesmäki & Vesala, (2022, forthcoming) for instance explores, with a micro-constructivist approach, how organic farmers reconstruct the notion of "good farmer" and associated conventional productive symbols through their conversion, by producing coherent identity narratives. Furthermore, researching on the types of sources of information (agricultural advisors, other farmers, fairs and training days) that facilitate farmers adoption of agroforestry practices would provide a better understanding on how exactly farmers benefit from their interactions with formal networks.

Finally, future research could make use of results of Paper I and compare the obtained results with a similar analysis of national policy documents related to e.g. environmental policy, which are not monitored by EU institutions to see to what extent national policy discourses are influenced by

EU institutions' ideas and rationales. Now that EU member states have relatively more responsibility in choosing the content of the eco-schemes with the new CAP, it would be interesting to complement the analysis of Paper I by exploring national policy discourses justifying the use of ecological approaches in policy documents supporting the implementation of eco-schemes, such as in the CAP strategic plans.

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Popular science summary

As you probably have already purchased certified organic products, have you ever wondered why farmers choose to produce such products? While economic and monetary motivations do play a role in their decision, this thesis gives special attention to motivations that, one farmer once told me, “come from the heart”. Farmers are, after all, managing a business, but when it comes to producing food in a way that aims to provide benefits to society, other explanations than money may come into play. This thesis explores farmers’ psychological and social motivations for adopting farming techniques that are advocated as being beneficial for the environment and society. Other farming practices than organic farming are also covered, which I generally refer as “ecological approaches”. In fact, we may tend to focalise on organic farming as organic products are mostly what we see in our supermarkets but there are, in the end, a wide range of other farming practices and systems that are beneficial for the environment and for us.

This thesis is composed of policy documents analysis, interviews carried with farmers from three different EU countries and survey data from Sweden. My first article does not focus on farmers’ motivations, but instead looks at how policy-makers justify supporting ecological approaches in farming. We find that ecological approaches to farming are primarily advocated to conserve biodiversity, preserve the environment and conserve cultural heritage by studying the Rural Development Programmes of six EU countries and regions. My second article reveals that farmers running a business with certified organic production and a business with conventional production are driven by a set of financial, social and environmental rationales. In contrast to the first article which shows that policy-makers mainly emphasize environmental types of justifications for implementing these approaches, this second article shows that farmers with organic

production are also driven by social motivations such as “societal security”, “societal health” or lifestyle types of rationales, such as “life quality”. We find in this second article that respondents with conventional production are also driven by non-financial or non-economic rationales. Respondents with organic production are however driven by a wider range of these types of motives. The third article provides a review of the already published quantitative literature and also shows that there is evidence that farmers who adopt ecological approaches are driven by both financial and non-financial perceived benefits of these practices. Finally, my fourth paper explores a set of social and psychological factors for farmers’ adoption of agroforestry in Sweden. Results indicate that farmers’ involvement in formal networks such as farmers’ associations and farmers’ unions play a positive role on their adoption.

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How are ecological approaches justified in European rural development policy? Evidence from a content analysis of CAP and rural development discourses

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ABSTRACT

Ecological approaches to farming are gaining increasing interest in the EU's Rural Development (RD) policy. From a societal perspective, these approaches are expected to deliver public goods in terms of environmental and social benefits for both consumers and rural actors. This study aims to investigate the policy discourses that are being used in the Rural Development Programmes (RDPs) of Sweden, France, Bavaria, Hungary, Poland and Romania to depict and justify the support for ecological approaches across three programming periods of the Common Agricultural Policy (CAP). For this purpose, a model integrating both CAP and RD discourses was developed and applied using deductive content analysis focused on the policy documents of RDPs. The results suggest that during the entire CAP period from 2000 to 2020, ecological approaches were mainly justified in a multifunctionality discourse, especially with the two RD discourses of i) nature conservation in all considered EU member states and regions, with the exception of Sweden, and ii) agri-ruralism, including Sweden. The neo-mercantilist discourse appears to be the third most dominant discourse in the two most recent CAP periods from 2007 to 2013 and 2014–2020, becoming more prominent between these two periods. Ecological approaches are almost never advocated along liberal lines as the neo-liberalist discourse is almost absent. These results highlight that these six EU member states and regions recognize the potential of these approaches for delivering public goods, despite a lesser emphasis on socio-economic benefits.

1. Introduction

Since the MacSharry reforms of 1992, the European Commission has signalled its willingness to 'green' its Common Agricultural Policy (CAP) by making agriculture more compatible with environmental sustainability. Recently, ecological approaches to farming were encouraged by the CAP and were promoted as having the potential to deliver public goods to society (European Commission, 2019a). These approaches consider the mobilization of ecosystem services from animals, plants and other organisms that can directly or indirectly benefit agricultural

production, such as pollination, soil formation, nutrient cycling, water purification and climate regulation (Bonmarco et al., 2013). Compared with conventional agriculture, they are expected to provide a more sustainable way of producing food without compromising yields and farmers' profitability (Garibaldi et al., 2017). By respecting the soil, water, air and biodiversity, these approaches can be beneficial for both consumers and rural actors such as farmers, who depend on these natural resources.

Agricultural policy measures, such as those from the Rural Development Programmes (RDPs) of the CAP, function as a way for society to

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communicate the desired future direction of farms and to influence farmers' behaviour (Recanatì et al., 2019). RDPs are policy documents drafted by EU member states under the second pillar of the CAP. This pillar focuses on measures for rural development (RD) policy and aims to promote functions other than the original productive functions of agriculture that are supported by the first pillar of the CAP, which provides direct income support to farmers (Bureau and Thoyer, 2014). From an economic perspective, the basic rationale for any policy is to address market failure(s) originating in positive or negative externalities. Regarding the promotion of ecological approaches in agriculture, differences in policy measures across EU member states may be attributable to different societal attitudes, societal understanding and the problematizing of agricultural externalities. One way of understanding such differences at the societal level is to view them as originating in different discourses (Nilsen and Ellingsen, 2015). In fact, discourses can be considered to be supporting a well-entrenched policy paradigm, comprising ideas about “what can and should be done in a sphere of policy” (Hall, 1993: 290) or which policy goals should be achieved using certain policy instruments (Alons, 2017). Thus, a discourse analysis of the policy could help understand the policy justifications associated with ecological approaches and, in particular, how they are promoted from a public good perspective across different EU member states. Furthermore, as EU member states enjoy relatively more flexibility in adapting the second pillar's measures to their specificities compared to the first pillar (Agra Europe, 2006), focusing on the RDPs in order to examine policy discourses could reveal these contrasting societal views. This would not only inform about how ecological approaches are perceived and promoted in different societies but also about the types of approaches that are recognized in national policy. Both these dimensions could, in turn, add to the understanding of the potential reasons for regional differences in the uptake of ecological approaches in rural areas.

Previous literature on the agricultural policy discourse has focused on commissioners' speeches and other policy documents (Alons, 2017; Clark et al., 1997; Erjavec and Erjavec, 2009, 2015; Erjavec et al., 2009; Potter, 2006; Potter and Tilzey, 2005). Another branch of literature (Elands and Wiersum, 2001; Hermans et al., 2010; López-i-Gelats et al., 2009; Quétier et al., 2010; Selby et al., 2007), which focuses more on RD, highlights the different functions of rural areas as reflected in different socio-political discourses, originally developed by Frouws (1998). While being mutually complementary, thus far, both areas of literature have not investigated how the CAP and RD discourses are used in the CAP rural development policy. Furthermore, despite the European ambition to promote ecological approaches to farming, these have rarely been explored through discourses, with the exception of Lynggaard (2007), who focuses on the policy field of organic farming in the CAP. Finally, there is a lack of geographical comparison in this literature, which would be useful for identifying the differences in national policy discourses.

Accordingly, this study aims to explore CAP and RD discourses in relation to how certain EU member states and regions justify their use of ecological approaches to farming in the policy documents of RDPs, by using a deductive content analysis (CA). Following Rega et al. (2018), ecological approaches to farming are categorized in five clusters of farming systems: agroecology, organic farming, integrated farming, low-input farming and conservation agriculture. RDPs have been collected for the 2000–2006 CAP period in Sweden, France and Bavaria, as well as in Hungary and Poland, which joined the EU in 2004; for the 2007–2013 CAP period in the same member states and regions, as well as Romania, which joined in 2007; and, finally, for the 2014–2020 CAP period in all six member states and regions. National contextual information is provided that potentially influences the types of discourses and farming systems reflected in policy documents.

This study contributes to the literature in several ways. First, it is the first attempt to assess how CAP and RD discourses integrate ecological approaches. Second, it addresses the lack of geographical comparison by

studying the differences and similarities in policy discourses about ecological approaches across certain EU member states and regions. Third, it highlights how deductive CA can be used to trace and compare societal perceptions of public good components in ecological approaches and quantify the recognition of ecological approaches in RDPs.

The paper continues as follows: the conceptual framework first introduces the types of discourses and clusters of farming systems used in this analysis; the method is then outlined. The following results section presents findings on the dominant discourses for each CAP period, with a summary of their geographical and temporal comparisons, and reports on the number of references to ecological approaches from each RDP. Lastly, the results and policy implications are discussed.

2. Conceptual framework

2.1. Types of discourses and integrated model

2.1.1. The CAP discourses

As highlighted by Erjavec and Erjavec (2009), three different types of discourses have been identified in the scientific literature on the history of the CAP. After the Second World War, the CAP was founded on productivist principles that emphasized the productive and export capacities of European agriculture. At the time, the provision of a sufficient food supply to achieve food security justified state intervention. Farmers and their production were cast as public goods¹ that must be protected via market regulation and state assistance. Potter and Tilzey (2005) describe this first discourse of the CAP as *neomercantilist*.

At the beginning of the 1990s, a *multifunctionality* discourse appeared, depicting agriculture as achieving several functions: the sector not only produces food but protects the environment, preserves biodiversity, enhances rural landscapes, maintains viable social conditions for rural communities, and provides other services for society (Erjavec et al., 2009). This discourse was prominent during the Cork Declaration of 1996 on RD (Potter and Tilzey, 2005). More recently, the CAP has developed a *neoliberalist* discourse following budgetary restrictions and international trade pressure from the World Trade Organization (Erjavec and Erjavec, 2015; Potter and Tilzey, 2005). Competitiveness, flexibility and the liberalization of agriculture were newly introduced notions which, at the time, gained prominence in the policy debate (Erjavec and Erjavec, 2009).

2.1.2. The RD discourses

While the above-mentioned literature has identified discourses related to agricultural policy in general, the literature on rurality focused on discourses of RD policies. The EU's RD policy, designed under the second pillar of the CAP, underlined three main objectives for rural areas during the 2007–2013 period: improving the competitiveness of agriculture and forestry, improving the environment and the countryside, improving quality of life and encouraging the diversification of economic activity (Agra Europe, 2006). According to Elands and Wiersum (2001) and López-i-Gelats et al. (2009), some parts of the countryside are experiencing a profound transformation in which agriculture is no longer the only sector of activity. In fact, different functions for rurality, such as “recreational activities, nature conservation, a clean environment, local culture, housing etc.” (López-i-Gelats et al., 2009: 602), are being promoted by various actors. Different views and opinions on the process and outcomes of RD policies are being expressed through diverse discourses. Hoggart et al. (1995), Frouws (1998) and Elands and Wiersum (2001) identified five socio-political discourses of RD, relevant to Europe. These discourses are characterized as being

¹ Note that the term *public goods* in this article is used in reference to two types of goods that are identified in agriculture literature: environmental and social goods, food security being classified as a type of social goods (Vanni, 2013).

socio-political in the sense that they were recognized from debates among public actors from politics, government, interest groups, administration, institutions etc., and therefore do not represent the views of rural or urban dwellers (Elands and Wiersum, 2001; Frouws, 1998). The following three discourses are derived from Frouws (1998), who focuses on rural discourses from The Netherlands, but asserts that they are applicable to other Western European countries: *agri-ruralist*, *utilitarian* and *hedonist* discourse. The validity and accuracy of Frouws' framework has more recently been re-evaluated by Hermans et al. (2010) in the case of The Netherlands, but by relating these three discourses to sustainable rural development. Their results support most of Frouws' original typology, although discourses on sustainable agriculture are seen as a natural extension of these rurality discourses. To some extent, the concept of sustainable agriculture is covered by the *nature conservation* discourse from Elands and Wiersum (2001), which is presented later in this section. Furthermore, as stated by Hermans et al. (2010), the debate on sustainable rural development is more topical than ever at the European level, hence the relevance and contribution of this study to relating these discourses to ecological approaches across certain EU member states.

In the *agri-ruralist* discourse, farmers are regarded as being the stewards of the countryside, carriers of rural values such as “food production, nature and landscape conservation, open space and cultural heritage etc.” (Frouws, 1998:58). As explained by Frouws (1998), in this discourse, craftsmanship, family farms and traditions should constitute the main mode of agricultural production. Criticized for polluting the rural environment with modern farming methods, farmers should practice a multi-functional type of agriculture that meets social demands for products such as healthy foods and pure drinking water (Frouws, 1998:58). For Frouws (1998), the *hedonist* discourse emphasizes the cultural dimension of rurality. The countryside is regarded as playing a cultural role in that it should provide a certain quality of life through beauty, attractive landscapes and quietness. The priority of RD is to regenerate the aesthetic nature of rural scenery. In the *utilitarian* discourse, RD is instead conceptualized on economic dimensions (Frouws, 1998). Rural areas are considered economically underdeveloped because of inefficient regulation and the need to expand through market integration, innovative economic activities and investment (Elands and Wiersum, 2001).

Based on the work of Hoggart et al. (1995), Elands and Wiersum (2001) add two types of discourses that are relevant to covering the broader European debate on rural development: *community sustainability* and *nature conservation*. For Elands and Wiersum (2001), the *community sustainability* discourse emphasizes the need for rural areas to be economically revitalized through improved living conditions. Thus, RD should aim to create a “minimum set of social and economic structures” (Elands and Wiersum, 2001: 12) for rural populations. Employment and income must be supported through state intervention and regulation and, compared to the *utilitarian* discourse, market forces should play an insignificant role. Regarding *nature conservation*, Elands and Wiersum (2001) define this discourse as criticizing the intrusion of agriculture into wilderness and the threat it constitutes to biodiversity. Nature is considered to have intrinsic values that need to be preserved for future generations. Eco development is being promoted, rather than RD, with the final objective of recovering “a balance between the rural and wilderness areas” (Elands and Wiersum, 2001: 12).

2.1.3. Integrated model

Since our study focuses on the RDPs designed under the second pillar of the CAP, it is necessary to use both types of discourses described in 2.1.1 and 2.1.2 in this analysis. Furthermore, the RD discourses parallel the objectives set by the European Commission for its RD policy. For example, the ambition to diversify economic activity in rural areas echoes what is promoted in the utilitarian discourse. However, the various roles promoted for agriculture in the CAP's multifunctionality discourse are somewhat redundant compared to the rurality functions

promoted in each of the RD discourses. For example, the multifunctionality and the *agri-ruralist* discourse both refer to environmental protection and the multifunctionality and the community sustainability discourse both refer to employment generation and the maintenance of viability in rural areas. This overlapping can be explained by the fact that multifunctionality was promoted by the CAP during the 1990s at a time when its RD policy was emerging. Furthermore, in the CAP documents of the 2014–2020 reform, Erjavec and Erjavec (2015) noted that support for RD policy was described in both a multifunctional and neomechanist discourse, although the latter was used in conjunction with multifunctionality. This shows the interconnection between multifunctionality and the CAP's policy objectives of RD, which are theorized in the RD discourses.

Thus, for the purposes of this study, we have integrated the different socio-political discourses of RD as sub-discourses of multifunctionality (Fig. 1). We consider that RD discourses cannot be similarly related to neomechanism and neoliberalism since they are specific to RD policy, while neomechanism and neoliberalism are conceptualized at a broader level of the CAP. RD discourses promote the generation of public and private goods for national rural development, while neoliberalism is conceptualized at a macro level through the promotion of transnational agribusiness and collaboration with international trading partners. However, this does not exclude the possibility that the discourses from the integrated model can be used together, when a policy objective relating to ecological approaches is being justified.

2.2. Clusters of farming systems that integrate ecological approaches

In order to categorize clusters of farming systems that use ecological approaches to agriculture, we have adopted the classification system proposed by Rega et al. (2018), in which existing categories of farm types, based on the degree of uptake of ecological approaches to farming, were identified from an extensive literature review. They identified a total of five clusters of farming systems: agroecology, organic farming systems, integrated farming systems, low-input systems and conservation agriculture (Table 1). The characteristics of these systems are summarized in Table 1. Appendix 1 provides information on all types of practice associated with each of these clusters.

3. Method

3.1. Deductive content analysis

This study used deductive content analysis (CA) to explore the types of CAP and RD discourses used to justify the support for ecological approaches. According to Berelson (1952), CA is a “research technique for the objective, systematic and quantitative description of the manifest content of communication.” (Berelson, 1952). Thus, it was originally defined as a quantitative method for analysing qualitative data, aiming to describe and quantify specific phenomena (Downe-Wamboldt, 1992). In order to achieve this, CA compresses large amounts of words by classifying words, phrases or other textual units into categories that share similar meanings (Cavanagh, 1997). In this study, the relative frequency of categories of discourses is compared across space and time.

Two approaches to CA can be used: inductive and deductive. The deductive approach classifies text into pre-defined categories, derived from previous work and theories, while the inductive approach develops categories directly from the text (Elo and Kyngäs, 2008). One of the purposes of deductive CA is to test existing categories or concepts in a different context with a new type of data (Kyngäs and Kaakinen, 2020). This type of CA is also useful for comparing and replicating an analysis across time and geographical units (Elo and Kyngäs, 2008).

In this study, deductive CA has been used to explore how CAP and RD discourses are identified in a new context: what type of commonly studied discourses appear in the policy documents of RDPs when associated with ecological approaches? This approach also allows us to study

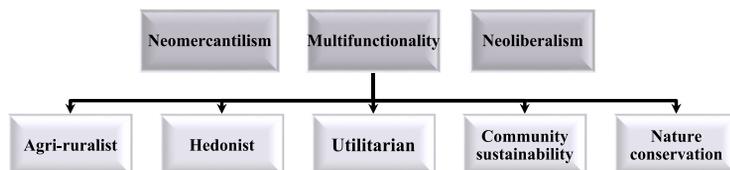


Fig. 1. Integrated model of CAP and RD discourses.

Table 1
Main characteristics of farming clusters. Source: Rega et al. (2018).

Farming cluster	Characteristics
Agroecology	<ul style="list-style-type: none"> - Considered to be a science, social movement and practice - Use of biodiversity and its ecosystem services to enable farmers' resilience and generate environmental, social and economic benefits
Organic farming	<ul style="list-style-type: none"> - Regulated through certification - Synthetic chemical fertilizers, pesticides and mineral fertilizers are forbidden - Crop rotation, reduced tillage, natural pest control, use of green animal manure and cover crops
Low-input farming/ extensive farming	<ul style="list-style-type: none"> - Minimizes the use of external inputs while optimizing the use and management of on-farm resources - Limits groundwater and surface water pollution, pesticide residues in food, farmers' overall risk and improves farm profitability
Integrated farming	<ul style="list-style-type: none"> - Inorganic inputs can be used although not as systematically as in conventional farming and in lower amounts - Promotes healthy soil conditions, nutrient and pest management
Conservation agriculture	<ul style="list-style-type: none"> - Preserves soil quality: reduces soil disturbance through the use of alternative tillage strategies, crop rotation, use of cover crops

this question across CAP periods and EU member states and regions. What discourse prevails in different periods? What types of public goods are promoted in French policy documents compared to Swedish policy documents when referring to ecological approaches? And last but not least, the quantitative feature of deductive CA is a valuable tool for assessing the extent to which ecological approaches have been emphasized in RDPs.

3.2. Coding scheme

In line with deductive CA, the coding scheme was designed based on the types of discourses and farming systems identified in previous literature. The first set of nodes gathered 34 codes containing information on farming clusters (five nodes) and farming systems (19 theme nodes) identified by Rega et al. (2018). The types of discourses introduced in section 2.1 and integrated together in Fig. 1 constitute the second set of nodes with three main nodes (CAP discourses) and five theme nodes (RD discourses). This coding scheme resulted in a two-dimensional categorization matrix (Table 2).

The sampling units comprised national policy documents of the CAP for the 2000–2020 period and were collected from the relevant case study areas. Specifically, national policy documents covered the three CAP periods as follows:

- i) CAP 2000–2006 in Sweden, France and Bavaria, CAP 2004–2006 in Hungary and Poland, which joined the EU in 2004
- ii) CAP 2007–2013 in the same case study areas, as well as Romania, which joined the EU in 2007
- iii) CAP 2014–2020 in all six case study areas

The specific policy documents sampled from each case study area comprised national RDPs (see supplementary material). The entire policy document was considered for coding. Regarding the coding unit, which refers to the segment of text placed in the categorization matrix, one sentence, multiple sentences, or a paragraph could be coded. Since the text segment aimed to include information related to the farming system and policy discourse, restricting the coding unit to a sentence sometimes led to the fragmentation of information. Actually, at times, policy justification for encouraging a farming system or practice appeared at the end of a paragraph. Thus, in some cases, it was necessary to allow for such a larger coding unit.

During the coding process, a farming system was first identified in the text before being associated with one or several discourse categories. The authors could use two different ways to code for a farming system: either if the text directly referred to a type of farming system from Table 2 or if the text directly referred to a farming practice from Appendix 1. The second way involved coders using the table from Appendix 1 to link the identified farming practice to one or several farming clusters in Table 2. Regarding the discourse categories, Table 3 provided a list of themes for each discourse to be used by coders as definitions. If at least one theme from a discourse was recognized, the coding unit was associated with that discourse. The same unit could be associated with multiple discourses.

Reliability was verified by crosschecking the results in each case study team. This could be conducted in two ways: in some case study teams, a third person on the project double-checked the chosen classification of the text for a farming system and a type of discourse.² In other case study teams, in which the coders had originally divided the coding of documents among themselves, they double-checked each other's classifications. The classifications of references were discussed until consensus was reached. Only minor revisions were reported.

It should be noted that two types of discourses did not emerge as mutually exclusive categories for some coders: the complexity of agriruralism could overlap with nature conservation. In order to limit making subjective decisions when selecting one type of discourse instead of another, we allowed for the possibility of associating a coding unit with multiple discourse categories. Similarly, given the conceptual framework, some farming practices could be associated with multiple farming clusters, for example, cover crops, crop rotation (see Appendix 1). Thus, some types of farming clusters were not mutually exclusive categories. However, only farming clusters marked with a double cross "XX" in Appendix 1 were coded, meaning the associated practice typically represented that particular farming cluster instead of just being recurrently associated.

3.3. Sampling and specificities of case study areas

The selected sample of case study areas is representative of diverse

² In Bavaria, a 40% sample of references was randomly drawn for cross-check.

Table 2
Categorization matrix.

Farming clusters	Farming systems	Discourse				
		Neomercantilism	Neoliberalism	Multifunctionality		
				Agri-ruralist	Utilitarian	Hedonist
Agroecology	Agroecology Biodiversity-based farming systems Diversified farming systems Eco-agriculture Ecological arable farming systems Permaculture Natural systems of agriculture					
Organic farming Systems	Biodynamic Biological input-based farming systems Organic agriculture Organic farming systems					
Integrated farming Systems	Integrated arable farming systems Integrated crop-livestock systems Integrated crop-range-livestock systems Integrated farming systems Integrated perennial crop systems					
Low-input/ extensive Systems	Extensive grass-based systems Extensive systems Low external input systems Low input systems Low intensity systems Reduced input systems Silvopastoralism					
Conservation agriculture	Conservation agriculture Conservative agriculture Minimum tillage systems No tillage systems Reduced tillage systems Strategic tillage systems					

parts of Europe: Western (France), Northern (Sweden), Central and Eastern (Bavaria,³ Poland, Hungary and Romania) and includes both old and new EU member states. This geographical and historical diversity represented by the six case study areas reflects diverse political institutional settings, levels of rural development, types of farming systems, as well as socio-economic and environmental challenges in rural areas that could influence policy justifications for encouraging ecological approaches and, consequently, the national policy discourse. These national contextual specificities are briefly outlined below.

First, the profile of agricultural production and farm structure is rather diverse across case study areas. While dairy production plays a prominent role in Sweden (European Commission, 2020) and Bavaria (STMELF, 2018b) crop production dominates animal farming in Hungary (NHRDP, 2011) and Romania (Institut National de Statistica, 2018); Poland and France have a rather diversified type of agricultural production (European Commission, 2015a). Regarding organic production, Sweden has the highest proportion of fully converted organic area across the entire UAA, with 20% in 2018, followed by France and Germany (in the entire territory) with 7%, Hungary with around 4% and less than 4% in Poland and Romania (Eurostat, 2020). Old EU member

states such as Sweden, France and Germany (Bavaria) are characterized by larger farms. New EU member states such as Hungary, Poland and Romania are characterized by smaller farms and also have a relatively lower level of mechanization and investment in fixed assets, which has consequences on productivity and farming intensity (Pawlewicz and Pawlewicz, 2018). However, while Poland had traditional methods of cultivation when it joined the CAP (RDP, 2005), it has modernized its farm buildings and equipment, particularly during the 2007–2013 RDP (Bartkowiak and Bartkowiak, 2017).

Second, the case study areas face different challenges in the rural sector, considering their diverse historical, economic and environmental specificities. In Sweden and Bavaria, the decreasing number of commercial farms and their resulting increased size is considered problematic (European Commission, 2019c; STMELF, 2018a). A low level of profitability in all farm sectors is another challenge in Sweden (European Commission, 2019c), while rising land prices and difficulty accessing farmland is an issue in Bavaria (STMELF, 2018a). In France, RD addresses multiple types of objectives: from urban planning, nature protection, combating unemployment, to the preservation of rural identities (Trouvé and Berriet-Sollic, 2010). Instead, the new member states highlight the severe economic and social difficulties they are experiencing in rural areas. In both Poland and Romania, a lack of basic infrastructure and services has been linked to a risk of poverty and social exclusion. Poor technical equipment and a lack of market integration through innovations have also been mentioned (European Commission, 2015b, c). Hungary is facing a low level of rural employment and a lack of biodiversity protection, with 83% of habitats in poor condition (European Commission, 2019b). In terms of environmental challenges,

³ A region of Germany was selected instead of the whole of Germany because the inclusion of a federal state would have led to a lack of homogeneity, from both a societal perspective on ecological approaches and in the application of ecological farming measures. Each region of Germany has its own competent authority and defines its own RDP. Bavaria is one example that had already implemented ecological approaches.

Table 3
Themes of CAP and RD discourses.

	Type of discourse	Themes
CAP discourses	Neomercantilism	State protection/Market regulation Productivism/Food security Exports/Competitiveness
	Neoliberalism	Deregulation Trade competition
	Multifunctionality	Environmental protection Viability of rural areas Biodiversity protection Sustainability of rural landscape and cultural heritage
Socio-political discourses of RD	Agri-ruralist	Farmers, as stewards of the countryside, promote the following: food production, nature and landscape conservation, open spaces and cultural heritage Local production and handicrafts Healthy and quality foods Agricultural practices that respect the environment and/or animal welfare Ecological modernisation
	Hedonist	Aesthetic/cultural values of the landscape Quietness/quality of life for urban dwellers
	Utilitarian	Innovative economic activities (e.g. ecotourism, housing, high-tech agriculture) Openness to markets and investments in economic RD
	Nature conservation	Biodiversity/protected areas Eco-development
	Community sustainability	Basic community infrastructure for rural dwellers/improved living conditions Generation of employment and income

nitrogen pollution that harms water quality is of concern in all case study areas and eutrophication of the Baltic Sea is a particularly significant issue in both Poland and Sweden (Grizzetti et al., 2011). Soil degradation by water erosion is also a significant threat in several case study areas, particularly in France and Romania, which exhibit a high soil loss rate (Panagos et al., 2015).

Lastly, it is important to take into consideration the national institutional specificities that could influence policy priorities. For example, while France is regarded as embodying the productivist tradition (Erjavec and Erjavec, 2009), Sweden is known for its more stringent environmental and animal welfare regulations (Regeringskansliet, 2015).

4. Results

First, this section presents in detail the dominant discourses about ecological approaches found in each CAP period. We define “first dominant” as the type of discourse that had the highest percentage of coded references in at least 50% of the case study areas; the “second most dominant” as the type of discourse that had the second highest percentage etc. Second, these dominant discourses are compared over time and countries. The nature conservation, agri-ruralism, community sustainability and hedonist discourses, which are mentioned below, are conceptually included in the multifunctionality discourse (see Fig. 1.). Finally, the total number of references to ecological approaches from each RDP appear in the final sub-section 4.3.

4.1. Dominant discourses about ecological approaches

4.1.1. CAP 2000–2006

The nature conservation discourse is the first dominant discourse. It appears first in all case study areas, with the exception of Sweden, where

it appears second. Agroecology is frequently associated with justifications from the nature conservation discourses in Bavaria, Hungary, Poland, France and Sweden. Extensive systems are also often referenced in the case of Bavaria and France. The key focus in Sweden is on natural pasture lands, which should be managed in such a way as to conserve and enhance the fauna and flora (Regeringskansliet, 2000). Ley farming, riparian strips and landscape features are also regarded as being beneficial for promoting biodiversity, thereby providing important cultural heritage values, a concept which overlaps with the agri-ruralist discourse (Regeringskansliet, 2000). It is notable that what is promoted with this discourse is an integrated approach to nature conservation, in which cultivation favours biodiversity rather than segregation between nature and agriculture. Similarly, in Bavaria, policy measures that support more agroecology and biodiversity are related to integrated conservation, through the integration of nature into agricultural land to enable sufficient agricultural production, while ensuring the conservation of biodiversity. In contrast, France refers to the long-term removal of arable land as a mean of protecting biodiversity (PDRN, 2006). France has the highest share of coded references associated with nature conservation (68%), often in reference to extensive farming systems. For example, subsidies for maintaining grassland, in the case of extensive grass-based systems, are promoted as a way of preserving nature (PDRN, 2006). In Hungary, nature conservation refers to agroecology as a system for targeting soil erosion. This system is promoted as a solution for improving the situation of biodiversity, characterized by a significant loss of habitats for wildlife (NRDP, 2006). Most measures identified with nature conservation refer to agri-environmental measures and the Natura 2000 payments.

Agri-ruralism is the second dominant discourse. However, it is ranked first in Sweden with 67.5% of coded references. Sweden associates this discourse with diverse farming systems including agroecology, conservation agriculture and organic farming. Measures for promoting certain ecological practices such as ley farming, grassland, local varieties, catch crops and riparian strips are justified in order to limit nitrate pollution and nutrient leaching, which affect the environment. Other measures include improving soil structure, preserving traditional cultivation and conserving cultural heritage values in the case of semi-natural pasture lands and mown meadows (Regeringskansliet, 2000). In Bavaria, agri-ruralism is also related to agroecology, although primarily to extensive grass-based systems, which can be explained by the importance of the dairy sector. For example, environmental-friendly land management is encouraged on grasslands that are described as being part of the Bavarian cultural landscape (STMELF, 1999). In Hungary and Poland, agroecology is the main farming system justified in an agri-ruralist discourse, while this type of discourse is absent in France.

Neomercantilism and the community sustainability discourse were identified in policy documents, although they were of less importance. In Sweden, subsidies for organic farming are mostly justified on productivist grounds, which is a characteristic of the neomercantilist discourse. Neomercantilism also exists in Poland, where the competitiveness of integrated farming is encouraged through better quality certification that is demanded by domestic consumers (RDP, 2005). As an example of the community sustainability discourse, low-input farming is regarded as being a solution to generating income for farmers living in areas of low productivity in Hungary (NRDP, 2006).

4.1.2. CAP 2007–2013

Nature conservation re-emerges as the first dominant discourse for this period. It appears first in the case study areas of France, Bavaria and Hungary, while agri-ruralism is as equally represented as nature conservation in Romania. In Sweden and Poland, nature conservation is ranked second after agri-ruralism, although the difference in percentage points of coded references is minimal. In France and Bavaria, neomercantilism is primarily associated with agroecology and extensive systems, with few references to organic farming. An increase in

pollination areas and a reduction in polluting inputs, such as phytosanitary products, are examples of opportunities identified to enhance biodiversity in France (PDRH, 2011). In Bavaria, the potential of agroecology practices such as fallow land and semi-natural habitats on farmland has been recognized for enhancing and protecting areas of ecological importance (STMELF, 2007). Banning the use of chemical inputs is also regarded as being a way of maintaining or developing certain species (STMELF, 2007). In Romania, measures for encouraging agroforestry are justified to improve soil capacities, thereby increasing biodiversity (NPRD, 2015).

Agri-ruralism is the second most dominant discourse but is ranked first in Sweden and Poland. It depicts policy measures related to agroecology, organic farming and integrated farming. In Sweden, measures for the environmentally-friendly cultivation of local varieties have been implemented in order to maintain traditional forms of cultivation and cultural heritage, while introducing riparian strips aimed at limiting the environmental degradation of nitrogen leaching (Regeringskansliet, 2008). Measures associated with organic farming also emphasize the benefits for animal welfare (Regeringskansliet, 2008). Integrated farming in Poland is once again in focus and is promoted as being beneficial for environmental protection and human health (RDP, 2007).

The neomercantilist discourse is the third most dominant discourse. It is ranked third in Hungary, Sweden and Poland, while the hedonist discourse is ranked third in France and Bavaria; the community discourse is ranked third in Romania. Once again, organic farming is the system that is often justified with neomercantilistic perspectives in Sweden. For example, the Swedish government has highlighted the importance of increasing the organic food supply through investments and government intervention by promoting the consumption of certified organic products in the public sector (Regeringskansliet, 2008). Organic farming, agroecology and integrated farming are also depicted in this discourse in Hungary and Poland. The hedonist discourse is used in France, for example, when referring to grass buffer strips as a way of enhancing the landscape (PDRH, 2011).

4.1.3. CAP 2014–2020

Nature conservation remains the first dominant discourse for this final CAP period, although it is almost non-existent in Sweden. This discourse continues to cover varied types of farming systems within and across case study areas: agroecology, extensive farming, integrated farming and organic farming and, to a lesser extent, conservation agriculture. Measures most often relate to payments for agri-environment and climate commitments. Nature conservation dominates in Bavaria as it accounts for 78.8% of the coded references and refers to agroecology, as well as extensive and organic farming systems. Permanent pasture lands are promoted for preserving natural habitats (STMELF, 2018b). France asserts that biodiversity can be preserved through pasture, although overgrazing is regarded as being a potential threat. A reduction in chemical inputs is once again being encouraged in order to preserve biodiversity as their overuse can threaten flora and fauna (DCN, 2015). In Hungary, agroecology practices such as semi-natural habitats are being encouraged in order to preserve natural life and organic farming is described as a system that promotes a “natural balance among plants, animals and soils” (MVP, 2014). The benefit of catch crops is mentioned in Poland for increasing species diversity and pollinators (RDP, 2018).

Once again, the agri-ruralist discourse is the second most dominant discourse. It is ranked second in France, Romania and Hungary. However, it is ranked first in Sweden, in which the identified agricultural practices are often part of agroecology and aim to decrease nutrients and nutrient leakage, greenhouse gas emissions and improve water quality (Regeringskansliet, 2015). Organic production is promoted as being an appropriate system for improving soil quality and animal welfare via feeding methods and environments that meet the natural behavioural needs of animals (Regeringskansliet, 2015). The agri-ruralist discourse is also important in Romania and is mainly used to promote the

environmental benefits of organic farming and agroecology. Organic farming is particularly regarded as being a system that provides environmental public goods to society (NPRD, 2019).

Finally, neomercantilism is the third most dominant discourse. It is particularly important in Sweden and Poland to argue that farmers should be compensated through subsidies and investment support, for lost income and additional costs arising from practices that produce social goods (RDP, 2018; Regeringskansliet, 2015).

4.2. Temporal and geographical comparisons

The above-mentioned results have identified three dominant types of discourses: nature conservation (Fig. 2), agri-ruralism (Fig. 3) and neomercantilism (Fig. 4). We will now present how these discourses have evolved over the three CAP periods, across each case study area, to assess if specific trends emerge.

The nature conservation discourse is clearly present in France and Bavaria. This discourse is not as important in Sweden, where it became negligible during the most recent CAP period. The representation of nature conservation in the policy documents of Bavaria and Romania increased during the three CAP periods, whereas it decreased during the second CAP period in Poland, Hungary and France, before increasing again during CAP 2014–2020.

The agri-ruralist discourse dominates in Sweden across all three CAP periods and was also important in Romania during the last two periods. However, its representation decreased during the three CAP periods in Bavaria, Hungary and Romania and in all countries, with the exception of Sweden, between the two last CAP periods.

The neomercantilist discourse is mostly used in Sweden and Poland to justify the use of ecological approaches. Its proportion increased during the three CAP periods in Bavaria, Hungary and Romania, and between the second and third CAP periods in Poland and France.

4.3. References to ecological approaches

This section reports on the total number of references that were coded from each RDP (Table 4). This quantified type of result offers insights into how often ecological approaches, including both ecological farming systems and ecological farming practices, have been discussed and justified in policy discourses in RDPs. The findings indicate that ecological approaches are more frequently mentioned in the second and last RDPs, in the case of France and, in the last RDP, in the case of Sweden. In the new member states of Poland and Romania, ecological approaches have gradually become more prevalent over time. In the case of Hungary and Bavaria, these approaches were most often mentioned in the 2007–2013 RDP.

5. Discussion and conclusion

This study aimed to explore the dominant policy discourses used in the RDPs of six EU member states and regions to depict and promote ecological approaches during three different CAP periods. An integrated model containing both CAP and RD discourses was developed and applied using deductive content analysis. Compared with previous literature on CAP and RD discourses, the novel approach of this study allowed to assess how policy discourses integrate ecological approaches by using a broad typology of ecological farming systems. The study also contributes to the literature, in which there is a scarcity of geographical comparisons in national discourses related to RD policy, by contrasting them in certain EU member states and regions.

Overall, the findings suggest that ecological approaches are justified from a multifunctional perspective. They are particularly promoted as providing two main types of public goods: i) the preservation and enhancement of biodiversity through the nature conservation discourse and ii) respect for the environment and the conservation of cultural heritage and traditional modes of production through the agri-ruralist

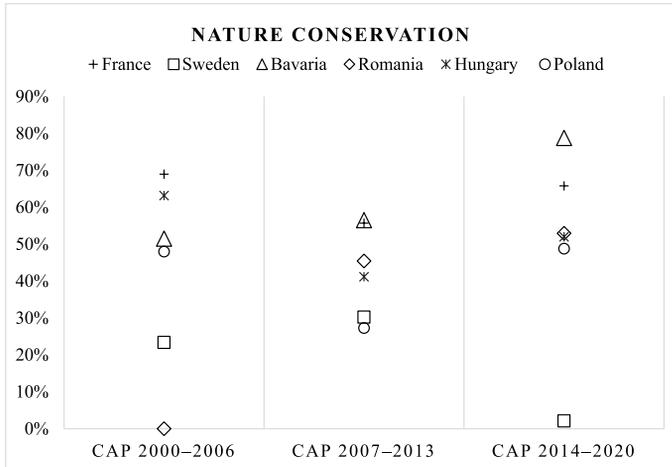


Fig. 2. Percentage of references coded in nature conservation across CAP periods and case study areas.

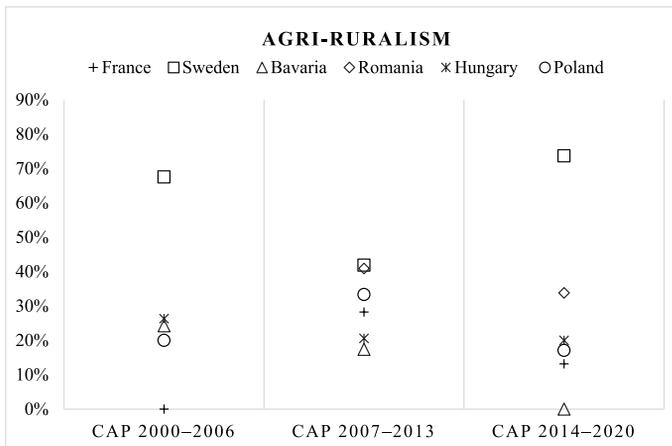


Fig. 3. Percentage of references coded in agri-ruralism across CAP periods and case study areas.

discourse. The findings indicate that these two discourses are often used simultaneously. This can be explained by the fact that preserving biodiversity entails respecting the environment (water, soils, etc.). With the exception of Sweden, the results suggest that the nature conservation discourse gained prominence between the 2007–2013 and the 2014–2020 CAP periods, while the importance of agri-ruralism discourse is relatively more important in this country. Neomercantilism has also been used to encourage ecological approaches on productivity and protective grounds. The findings indicate that it has become increasingly prominent over time, ranking third in at least 50% of the sample during the two last CAP periods. The largest increase was during the most recent period. This is confirmed by the recent literature findings in Commissioners’ speeches: the re-emergence of the traditional

neomercantilist discourse in the CAP agenda from 2014 to 2020 (Erjavec and Erjavec, 2015; Rutz et al., 2014). However, compared to previous literature, which has noted an increase in the CAP neoliberal discourse (Erjavec and Erjavec, 2009; Potter, 2006; Potter and Tilzey, 2005), this discourse is almost absent from our findings. For example, Erjavec and Erjavec (2009) found some elements of multifunctional agriculture associated with liberal rationales in Fisher Boel’s speech, when she referred to organic farming. In contrast, this study shows that when focusing on the discourse of certain EU member states and regions as embedded in their RDPs, ecological approaches are justified as serving national interests instead of being liberalized and promoted in external markets. These results confirm the important public good component that justifies rural policy: measures that support ecological approaches are driven to handle market failures by encouraging the provision of public goods. However, despite the previously mentioned economic

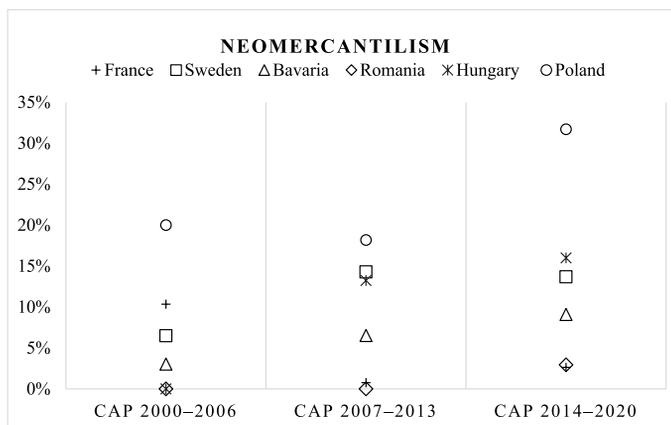


Fig. 4. Percentage of references coded in neomercantilism across CAP periods and case study areas.

Table 4

Total number of coded references from each RDP of the case study areas.

Case study area	2000–2006 ^a RDP	2007–2013 RDP	2014–2020 RDP
France	29	131	114
Sweden	77	43	95
Bavaria	33	46	33
Romania		21	68
Hungary	22	77	28
Poland	25	33	41

^a 2004–2006 RDP for Hungary and Poland.

issues faced by rural areas in new EU member states, ecological approaches are not really justified using the utilitarian discourse.

Finally, agroecology, together with biodiversity-based farming and organic farming, appear to be the most frequently mentioned farming systems. However, it is worth noting that as farming practices were also coded to be associated with farming clusters, and that some farming practices could be representative of multiple farming clusters (see Appendix 1), this analysis cannot inform on the most prevalent type of farming cluster. Furthermore, given the classification of Rega et al. (2018), many farming practices are associated with agroecology (Appendix 1), which may give the impression that this farming cluster is predominant. Thus, it is important to highlight that such result should not be interpreted as meaning “agroecology is a prevailing farming cluster”, but rather that multiple farming practices “construct” agroecology as a farming cluster. Regarding the support for ecological approaches, which refers to both ecological farming systems and ecological practices, the findings indicate that, in their respective RDPs, Poland and Romania have increasingly considered these approaches.

Several factors and mechanisms could influence a change of policy discourse across time and space – in our case, across the considered case study areas and CAP periods. These dynamics can be understood within the framework of Lynggaard (2007), which underlines the importance of new ideas and agents’ interests in policy change. It focuses on two phases: first, an articulation phase, in which ideas are translated into discourses; second, an institutionalization phase, in which discourses are translated into institutions. In our case, different discourses across case study areas can originate in the presence and influence of different stakeholders or concerned agents with different conceptions and ideas about societal services and public goods that can and should be provided by ecological farming. For example, a large national or regional presence of environmentalist organizations that value the provision of

healthy foods and a clean environment from agriculture would influence the articulation process of these ideas being translated into a national agri-ruralist discourse. As Lynggaard (2007:306) emphasizes, the articulation and institutionalization of these conceptions and ideas would depend on the role and legitimacy of these agents in the CAP debate. In fact, the CAP is characterized as a “multi-level governance system” in which member states, EU institutions and non-institutional actors interact with different agendas and discourses (Erjavec et al., 2009). As the European Commission sets policy objectives for EU RD, it is also an important agent to consider for forming ideas and discourses in RDPs. Focusing on RDPs as a sole source of policy documents for our deductive content analysis may have therefore introduced some standardization of concepts across case study areas. An interesting task for future research would be to compare with results obtained from a similar analysis of national policy documents related to e.g. environmental policy, which are not monitored by EU institutions. However, EU member states are responsible for deciding upon which type of policy measures should be implemented and funded in RDPs, depending on their national specificities, challenges and needs (Agra Europe, 2006). As implemented policy measures are justified according to national specificities, the identified discourses from RDPs capture these national arguments.

Furthermore, as Feindt (2010) points out, Lynggaard’s framework emphasizes ideas that are formulated “from the margins” rather than from the core of the policy process, as agents are embedded in one specific social context. This is relevant in relation to our study as contextual factors influence the ideas and discourses represented in national policy documents. Factors that explain why dominant discourses related to ecological approaches may differ between countries and over time are likely related to the social, economic and political context of each country. Future research should investigate how such factors shape the differences in policy discourse related to ecological approaches, and how the differences in policy discourse may be linked to differences in farmers’ adoption of ecological approaches.

In fact, policy justifications for encouraging ecological approaches could indirectly influence farmers’ uptake of such approaches. Using deductive CA, we were able to trace and quantify policy justifications in the form of policy discourses that reflected specific policy goals. As policy measures are implemented and justified in order to attain such goals (Hall, 1993), measures that support ecological approaches in RDPs may be more frequently adopted by farmers who are motivated by similar objectives. Farmers’ personal objectives, be they economic, environmental or sociocultural, are evidently an important behavioural

factor that influences practice adoption (Greiner et al., 2009; (Kallas et al., 2010); Buckley et al., 2015). Our findings indicate that EU member states and regions consider that ecological approaches should primarily preserve biodiversity and respect the environment through the conservation of cultural heritage and traditional production. Thus, policy that encourages ecological approaches may be predominantly adopted by farmers who identify themselves with such objectives. However, the potential socio-economic benefits of ecological approaches that contribute to rural vitality, such as profits, income, employment or improved living conditions, are not so much emphasized, as rationales from utilitarian and community sustainability are rarely used. Consequently, farmers who value such socio-economic objectives may not be motivated to adopt practices that are not justified according to their rationales. Thus, the types of policy discourses identified in this analysis could provide useful information for future research to investigate whether policy goals fit farmers' personal

objectives and whether this, in turn, influences farmers' adoption of ecological approaches.

Finally, this study provides information on the types of public good components that are associated with ecological approaches. From a policy perspective, this information could be used to justify supporting a broader set of ecological farming systems than organic farming alone, thereby contributing to the further uptake of ecological approaches.

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Appendix 1. Association of farming practices to clusters of farming systems

Practices	Agroecology	Organic Farming	Low-input/Extensive systems	Integrated farming systems	Conservation agriculture
Agri-environmental measures	X	X	X	X	
Agroforestry	XX			X	
Use of chemical inputs					X
Use of organic pesticides	X	XX	X	X	
Biodynamic preparations		XX			
Semi-natural habitat on farmland	XX	X	X	X	
Intercropping	XX	X	X	X	
Crop-livestock integration	XX			X	
Use of organic animal manure	XX	XX	X	X	
Use of green manure	XX	XX	X	X	
Biological pest control	XX	XX	X	X	
Biological nitrogen fixation	XX	XX	X	XX	
Cover crops	XX	XX	X	XX	XX
Conservative tillage	X	X	X	X	XX
Crop rotation	XX	XX	X	XX	XX
Sustainable water management	XX	X	X	X	
Extensive livestock systems	X	X	XX	X	
Inclusion of fallow land	XX	X	X	X	
Spatial heterogeneity	XX	X	X	X	
Selection of breeds and cultivars	XX	X	X	X	
Sustainable grazing	XX	X		X	
Integrated pest management			X	XX	
Low agrochemical input			XX	X	
Low fertilizers input	X	X	XX	X	
Low mechanization	X	X	X	X	X
Integrated nutrient management	X	X	X	XX	
Mulching	XX	XX	X	XX	X
Alternative weed management strategies	XX	XX	X	X	
Use of concentrate					
No use of concentrate	X	XX			
No use of chemical input	X	XX			
Management of soil organic matter	XX	XX	X	X	X
Precision farming					
Set aside	X	X	X	X	
Crop residue management	XX	X	X	X	X
Crop diversification/Polyculture	XX	X	X	X	

Note: X = recurrent association between farming system and practice; XX = practice that typically represent a specific farming system.

Source: LIFT Deliverable D1.1: Review of the definitions of the existing ecological approaches.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrurstud.2021.06.009>.

Credit author statement

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Vu Pham: Resources, Formal analysis. Marioara Rusu: Resources, Formal analysis

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This thesis investigates different “layers” of factors for farmers' adoption of ecological approaches, namely, *individual*, *social* and *material* layers. Paper I investigates how ecological approaches are justified in EU rural development policy. Paper II explores the types of values that drive farmers in their choice of farming system, organic vs. conventional. Paper III provides a systematic map of the quantitative literature studying adoption of ecological approaches. Paper IV analyses the role of behavioural factors on farmers' adoption of agroforestry practices.

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