

Utrecht University
Faculty of Geoscience

Effectiveness of Wild Pollinator Governance Arrangements in Germany and England

Master Thesis

Study Program: **Sustainable Business and Innovation (M.Sc.)**
Year 2020-2021

Supervisor Prof. dr. Hens Runhaar
Second Reader: Dr. Rak Kim

Word Count: 25.387 words (excl. tables)
Author: Bindel, Carina B.Ed. (6968023)
45 ECTS

Date of Submission: 13th July 2021

Utrecht, 13th of July 2021

Acknowledgement

After almost nine months, this roller-coaster ride of going from almost abnormal euphoria to despair on an hourly rate has come to an end. I'm proud and thankful to have taken this last step to obtain my master's degree and to have spent two beautiful years in Utrecht.

First of all, I'm proud of myself to have managed a change in careers so smoothly and without looking back too much and finding passion not only for one topic but for a variety of themes.

Secondly, this thesis could not have been created the way it is now without the help of my supervisor Prof. dr. Hens Runhaar. I'm thankful for an easy communication, that I could always reach you whenever I needed to, for your good feedback and to give me the opportunity to hold a guest lecture which ended up giving me motivation to go through the last month.

I would also like to thank all experts and farmers who took the time to talk to me. I'm especially thankful to Annik Dollack who was very invested and interested in my research, who connected me with multiple farmers and who ended up sending me information about pollinators whenever she read something new.

I'm also thankful for my Utrecht friend group the Inkredible Hazards for being on the same roller-coaster and thus understanding the mood swings, for exchanging our theses to proofread, for their constant support and for truly wishing and wanting the best for me.

Lastly I'm thankful for my family and especially my parents for their unconditional support in many different ways and for believing and trusting that whatever I do is what I am supposed to be doing.

Thank you!

Abstract

The abundance and diversity of wild pollinators have experienced a substantial decline in Europe in the last 50 years. Most commonly, this decline is caused by severe habitat losses connected to agricultural intensification and landscape fragmentation. Currently, there is no effective EU-wide approach to tackle this decline. Thus, many countries in Europe have developed their own policies. Extant scientific research focuses on assessing ecological effects of these policies, neglecting the social scientific perspective for analyzing the motivation of farmers to participate in them.

Germany and England are two countries that developed their own strategies. Germany typically follows a top-down-oriented approach with mandatory measures to be implemented by farmers while England approaches an interactive attempt with often voluntary initiatives. These different approaches to tackle the wild pollinator decline are interesting to assess for discovering their varying degrees of effectiveness concerning the farmer uptake.

Thus, this research firstly seeks to analyze current governance arrangements in both countries with expert interviews and desk research. It secondly evaluates the most effective approach and constituent initiatives concerning the uptake by farmers. This analysis assumes a theoretical framework that posits that the scope and the quality of an initiative play an essential role. Based on the framework, farmers should be motivated to participate, demanded, enabled, and legitimized for the participation in wild pollinator protection initiatives which was analyzed with expert and farmer interviews and desk research. Lastly, lessons were drawn from each country and a transfer of policy was considered.

The analysis showed that Germany is centrally governed with a focus on knowledge and habitat creation. England showed no obvious mode of governance, but most initiatives aim to include all stakeholders and are focused on habitat creation and habitat connection. The primary motivation for farmers to participate was to counteract civil societies' negative opinions about traditional farming and to receive monetary benefits. The centrally governed initiatives were assessed to be the most effective in both countries. In Germany, however, a lack of motivation among farmers to participate in these initiatives was found. In England, farmers' ability to participate limits the effectiveness and thus the uptake. Overall, this research showed that a systemic approach is needed to enhance current governance arrangements' effectiveness where governments ideally create initiatives in dialogue *with* farmers instead of *for* farmers.

Keywords: agricultural intensification, wild pollinator decline, agro-ecosystems, governance arrangements, mode of governance, impact assessment, lesson-drawing

Table of Contents

1	INTRODUCTION.....	7
1.1	PROBLEM STATEMENT	8
1.2	RESEARCH GAPS	9
1.3	RESEARCH AIM AND RESEARCH QUESTIONS	11
2	THEORETICAL FRAMEWORK.....	13
2.1	CHARACTERIZING THE GOVERNANCE OF WILD POLLINATORS	13
2.2	ASSESSING THE PERCEIVED EFFECTIVENESS OF WILD POLLINATOR GOVERNANCE ARRANGEMENTS	16
2.3	TRANSFER OF THE MOST EFFECTIVE MODE OF GOVERNANCE AND INITIATIVE	20
3	METHODOLOGY	24
3.1	CASE STUDY	25
3.2	DATA COLLECTION AND ANALYSIS	26
4	RESULTS	40
4.1	GERMANY	40
4.2	ENGLAND	62
4.3	TRANSFER OF THE MOST EFFECTIVE MODE OF GOVERNANCE AND INITIATIVE.....	78
5	DISCUSSION AND CONCLUSION	83
5.1	DISCUSSION.....	83
5.2	CONCLUSION.....	90
6	BIBLIOGRAPHY	96
7	APPENDIX.....	106
7.1	APPENDIX A: IMPACT ASSESSMENT GERMANY	106
7.2	APPENDIX B: IMPACT ASSESSMENT ENGLAND	113
7.3	APPENDIX C: INTERVIEW GUIDE EXPERTS GERMANY	119
7.4	APPENDIX D: INTERVIEW GUIDE EXPERTS ENGLAND.....	121
7.5	APPENDIX E: CONTACTED EXPERTS IN GERMANY.....	123
7.6	APPENDIX F: CONTACTED EXPERTS IN ENGLAND.....	126
7.7	APPENDIX G: INTERVIEWS GERMANY.....	129
7.8	APPENDIX H: INTERVIEWS ENGLAND	141
7.9	APPENDIX I: IDENTIFIED INITIATIVES IN GERMANY (PLUS EXCLUDING INDICATORS).....	153
7.10	APPENDIX J: IDENTIFIED INITIATIVES IN ENGLAND (PLUS EXCLUDING INDICATORS)	179

List of Figures

Figure 1: Modes of governance: S: state actors; M: market actors; CS: civil society actors	15
Figure 2: Proposed conditions for farmers to implement governance arrangements.....	19
Figure 3: Steps followed to answer RQ1	27
Figure 4: Visualization of IA	32
Figure 5: Steps to answer RQ 3.....	38
Figure 6: Use of croppable land in Germany in 2019 in mio ha	41
Figure 7: Insect decline in Germany.....	42
Figure 8: Modes of governance of identified initiatives in Germany.....	43
Figure 9: Reasons for excluding initiatives in Germany.....	44
Figure 10: Achieved score of identified initiatives in Germany (GER)	58
Figure 11: Achieved score, based on the mode of governance in Germany (GER).....	59
Figure 12: IA - Score based on scope and motivation	60
Figure 13: Distribution of use of croppable land in England in 2020.....	62
Figure 14: Changes in distribution of wild pollinators, 1980–2017, in the UK	63
Figure 15: Prevailing mode of governance in England.....	64
Figure 16: Reasons for excluding initiatives in England	65
Figure 17: Achieved score of initiatives - Germany (orange) and England (green).....	75
Figure 18: IA scoring motivation and scope of individual initiatives.....	75
Figure 19: IA scoring motivation and ability – Mode of Governance.....	76
Figure 20: Achieved score, based on the mode of governance in Germany (orange) and England (green) .	76

List of Tables

Table 1: Five modes of governance.....	14
Table 2: Dimensions and key features in modes of governance	15
Table 3: Five ways of how to draw lessons	22
Table 4: Used indicators to reduce the number of relevant initiatives.....	28
Table 5: Indicators to identify relevant experts.....	29
Table 6: Interviewed experts Germany.....	30
Table 7: Interviewed experts in England	30
Table 8: Explanation of achieved score.....	32
Table 9: Operationalization and influencing factors of conditions.....	33
Table 10: Operationalization for criteria of Impact Assessment	36
Table 11: Scoring System Impact Assessment.....	37
Table 12: Motivation and barriers to implement measures identified in literature.....	38
Table 13: Relevant initiatives in Germany.....	46
Table 14: Score distribution Action Program for Insect Conservation.....	51
Table 15: Score distribution Competition of Insect Friendly Farming	54
Table 16: Score distribution #Beebetter.....	57
Table 17: Summary of relevant initiatives in England	66
Table 18: Score distribution NPS	69
Table 19: Score distribution CSS	71
Table 20: Score distribution B-lines.....	73

List of Abbreviations**Abbreviation Meaning**

IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
CAP	Common Agricultural Policy
EFA	Ecological Focus Area
NGO	Non-governmental Organization
IA	Impact Assessment
LD	Lesson-drawing
PT	Policy Transfer
NPS	National Pollinator Strategy
BMEL	Bundesministerium für Ernährung und Landwirtschaft (Federal Ministry for Food and Agriculture)
BMU	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (Federal Ministry for the Environment Nature Conservation and Nuclear Safety)
BfN	Bundesamt für Naturschutz (Federal Agency for Nature Conservation)
EU	European Union
Defra	Department for Environment, Food and Rural Affairs
UK	United Kingdom
CCS	Countryside Stewardship Scheme
ELMS	Environmental Land Management Scheme

1 Introduction

Pollinators are essential for global food security and ecosystem health (Powney et al., 2019; Potts et al., 2010). Insect pollination is not only necessary for wild plants but also for a variety of crops across the world (Krimmer et al., 2019). Without wild and managed pollinators approximately 75% of the world crops, including fruits, vegetables, almonds, coffee or cocoa would suffer from decreased productivity and food production would either decrease or the pollination would need to be done by other means e.g. manual human pollination (Powney et al., 2019; Tirado, Simon & Johnston, 2013; Holzschuh et al., 2012). Furthermore, around 90% of wild flowering plants depend on the animal pollination (Kovács-Hostyánszki et al., 2017; Geppert et al., 2020).

The majority of pollinators are wild and consist of a diverse group of animals dominated, however, by insects. This especially includes bees but also some species of butterflies, moths, flies, wasps, beetles, thrips, birds, bats, weevils, birds, marsupials, rodents and reptiles. Some wild pollinators are plant specialized meaning that they feed and nest only from specific plant species. Therefore landscape fragmentation, habitat loss and the loss of food sources is often more critical to specified pollinators (Kovács-Hostyánszki et al., 2017). Additionally, some crops such as tomatoes or solanaceous peppers are insufficiently pollinated by managed pollinators and depend on wild ones such as the bumblebee (Shuler, Roulston & Farris, 2005).

Research by Persson et al. (2015) discovered that different pollinators might respond differently to configurational changes to landscapes. This explains why in human-changed landscapes some pollinators dominate and others are not to be found (Biesmeijer et al., 2006). This is problematic because wild pollinators cannot just get introduced to agricultural landscapes for pollination, compared to managed ones like the western honeybee (*Apis mellifera*) (Shuler, Roulston & Farris, 2005).

Agricultural intensification in the form of scale enlargement, shifts in land composition, spatial configuration, monoculture crops and the intensive use of fertilizers and pesticides around the world, but especially in North America and Europe, have led to a decrease in wild pollinators and a decrease in yield of agroecosystems (Eardley et al., 2016; Kovács-Hostyánszki et al., 2017; Krimmer et al., 2019; Cole et al., 2020). Hence, agricultural landscapes and practices are currently considered to be the main threat for pollinators (Holzschuh et al., 2008; Tirado, Simon & Johnston, 2013; Kovács-Hostyánszki et al., 2017; Cole et al., 2020).

Agricultural fields are considered to have poor nesting opportunities and food availability for wild pollinators. However, at the same time agricultural land is more dependent on pollinators than ever (Aizen et al., 2019).

Even though agriculture is seen as one of the main threats for pollinators, the Intergovernmental Platform on Biodiversity and Ecosystem Services report (IPBES) (2016), an international organization which aims to increase the inclusion of science in public decision making about biodiversity (ESA, n.d.), also identifies it as a solution. Approximately 40% of earth's surface is currently agricultural land. Thus, conservation practices targeted in farms have a great potential to contribute to the wild pollinator protection (Gaines-Day & Gratton, 2017).

Hence, an array of wild pollinators seem to be essential for efficient crop pollination and food diversity. Therefore stabilization and restoration measures, especially in agricultural landscapes should be taken (Vergara & Badano, 2009; Mallinger & Gratton, 2015; MacInnis & Forrest, 2019).

1.1 Problem Statement

Unfortunately, there seems to be an insufficient amount of robust regional and international research programs to regularly monitor the status and trends of wild pollinator population, hence there is uncertainty concerning the scale and the extent of global pollinator decline (Tirado, Simon & Johnston, 2013; IPBES, 2016). Additionally, there is an undue focus on the honey bee to the detriment of other crucial pollinators with risk assessments and regulations covering only the honey bee (Potts et al., 2010; Eardley et al., 2016). This is problematic because every species of pollinator might react differently to external influences such as pesticides or mono-cultures (Stoner, 2016; Franklin & Raine, 2019). Moreover, managed pollinators do not pollinate all types of crops humans utilize which depend on a variety of (specialized) wild pollinators (Shuler, Roulston & Farris, 2005).

Additionally, the European Commission (2018) identified that the decline of wild pollinators must be tackled on national as well as on an international level since they are not confined to national borders and are thus exposed to multiple pressures. Therefore, the EU has implemented various policies which can benefit all pollinators. Notably, environmental and health policies such as the Birds and Habitats Directives and EU legislation on pesticides so as the Common Agricultural Policy (CAP) have impacts on wild pollinators. Furthermore, the EU supports the implementation of national pollinator programs (European Commission, 2018).

To improve environmental sustainability and to increase biodiversity, including pollinators, the 2014 EU Common Agricultural Policy (CAP) defined multiple habitats and landscape features, the so-called Ecological Focus Areas (EFAs), which farmers can choose as requirements to get basic farm payments (Cole et al., 2020). The CAP 2014-2020 was created to support farmers and ensure food supply through short-term payments for farmers to implement set environmental management measures (de Snoo et al., 2013). However, the CAP 2014-2020 was criticized for its theoretical approach and the lack of implementation guidance for farmers, and it was also accused of decreasing competition and favoring larger farms (Hevia et al., 2020) and it is thus not considered an effective approach to tackle the wild pollinator decline.

While there are some European-wide policies concerning the protection of wild pollinators, there has not yet been an effective approach to slowing their decline (Hevia et al., 2020). Therefore, individual European countries have developed their own strategies and governance arrangements to counteract this decline and restore wild pollinators' populations and diversity. This includes national governmental pollinator initiatives in some EU countries, while others seem to rely on NGO-run voluntary initiatives for farmers. Furthermore, there is no unitary funding strategy and different countries have various stakeholders involved in the decision-making process on how to protect wild pollinators (Underwood, Darwin, & Gerritsen, 2017).

In conclusion, the central problem addressed by this thesis is the lack of an EU-wide approach to stabilize the number and diversity of wild pollinators which has led to the development of different approaches in various countries. However, there is no assessment on how effective those governance arrangements are concerning the uptake and motivation of farmers to participate and implement measures.

1.2 Research Gaps

There are multiple researchers focusing on the decline of pollinators in Europe. However, most researchers focus on ecological factors to measure the success of emerging governance arrangements such as the increase in pollinator populations (Geppert et al., 2020). Additionally, most research focuses on individual drivers of global pollinator decline and neglects the interconnectedness of those drivers (Eardley et al., 2016). Moreover, most research on wild pollinators thus far has been environmental, entomological and agro-ecological, rarely

focusing on farmers' motivation to participate in initiatives (Christmann et al., 2017). Therefore a lack of social-scientific research has been found.

There has been research on the role of farmers concerning the protection of biodiversity (Wilson & Hart, 2001; Wynne-Jones, 2013) and how farmers behavior can be changed to focus on environmental management (Burton & Schwarz, 2013; de Snoo et al., 2013). There is also research on the reasons for farmers to implement agri-environmental schemes or not (Wilson & Hart, 2001; Wynne-Jones, 2013). However there is a lack of focus on the assessment of motivation of farmers to participate in governance arrangements focused on the protection of wild pollinators. This is problematic because the motivation of farmers might be crucial for policy makers to adapt governance arrangements to create arrangements that have large-scale uptake by farmers and stabilize the number and diversity of pollinators around Europe.

Due to the lack of social-scientific research and a lack in international governance arrangements to protect wild pollinators, research should be done focusing on drawing lessons i.e. what key actors and policy instruments are considered effective in other countries concerning the influence on the motivations of farmers to participate. Additionally, it would be fruitful to assess which are the most effective modes of governance in different countries, how these are connected to the motivation of farmers to uptake the governance arrangements, and assess whether those strategies are suitable for implementation in other political settings. Up to now, there seems to be no research focusing on lessons that can be drawn concerning governance arrangements for wild pollinator protection.

The IPBES (2016), reported that many actions focused on increasing and supporting wild and managed pollinators could be implemented more effectively with improved environmental governance i.e. the measures that a purposely taken to restore the number and diversity of wild pollinators. The concept of environmental governance addresses, among other topics, biodiversity related issues. Environmental governance in this case refers to the ways in which farmers i.e. society determines and acts on goals, instruments, rules and procedures to manage the decline of wild pollinators with an increasing attention to the interaction between actors from the state, market and civil society (Driessen et al., 2012). The IPBES report suggest that for example top-down government policy might be too homogenous and therefore does not allow for local adaptations. Hence, they suggest alternative governance arrangements to achieve long-term improvements in pollinator diversity and stability (IPBES, 2016). The report discusses general responses to pollinator loss, however it does not identify and evaluate

governance arrangements. This, however, seems to be essential before recommendations for improved governance can be given.

1.3 Research Aim and Research Questions

Therefore, to my best knowledge, there seems to be a lack of research on the effectiveness of wild pollinator governance arrangements in agricultural landscapes, especially concerning the motivation of farmers to participate. Germany and England are two countries in the EU that appear to have different approaches and governance arrangements concerning wild pollinator protection. Germany seems to be governed more top-down whereas England focuses more on voluntary initiatives for farmers to implement, often initiated by the government and NGOs in collaboration (Underwood, Darwin, & Gerritsen, 2017). It is thus interesting to compare their effectiveness and the motivation farmers have to join them. Furthermore it is of interest to determine if the mode of governance of an initiative is a crucial factor for its effectiveness. Additionally, it is interesting to investigate if there are lessons that can be drawn from one country that can be theoretically transferred to another.

This research will aim to answer the question whether the different degrees of effectiveness of the identified governance arrangements in Germany and England can be explained by their different modes of governance. This will be done by answering three main research questions:

1. RQ1: How, by whom and with what objectives is wild pollinator conservation in agricultural landscapes governed in Germany and England?
2. RQ2: How effective are governance arrangements in those countries and what motivates farmers to adapt their practices to participate?
3. RQ3: Can the most effective mode of governance work in the other country and are there lessons that can be learned and transferred?

To lay the *theoretical framework* of this thesis, Driessen et al., (2012) framework concerning ‘Modes of Governance’ will be introduced first. Secondly, impact assessments and theoretical barriers and motivations of farmers to participate in initiatives will be assessed. Lastly, policy transfer and lesson learning considerations will be introduced.

Next, the research’s case selection of *Germany* and *England* will be justified along with the *methodological* steps to be taken to answer the research questions.

This will be followed by the *results* section. In this chapter an introduction about the agricultural sector and the pollinator decline in the countries will be given first. Afterwards the initiatives to be investigated will be introduced, the impact assessment of those initiatives will be done and farmers motivation to join them will be highlighted. Additionally, lessons learned will be assessed. In the second part of the results section, similarities and differences of those initiatives and the countries will be highlighted and it will be discussed whether the most effective initiative could work in the other country and what are barriers for farmers to adopt them.

Finally it will be *discussed* how this research fits to current literature, how it expands it and what the limitations are. Additionally further research propositions are given and lastly *conclusions* on the research questions will be drawn.

2 Theoretical Framework

In this section, the ‘Modes of Governance’ framework by Driessen et al. (2012) will be introduced to identify goals, policy instruments and main actors in the initiatives to be investigated and to assess the prevailing mode of governance in each country to answer RQ1. In this thesis, the terms ‘initiative’ and ‘governance arrangements’ will be used interchangeably. After this, impact assessment is introduced, which will be used to assess the effectiveness of the three most relevant initiatives in Germany and England and to assess motivations and barriers for farmers to implement pollinator benefitting measures and thus answer RQ2. Lastly, policy transfer theory will be introduced which will be used to evaluate whether there are lessons that can be drawn i.e. what key actors and policy instruments and governance arrangements in general are effective in the other country concerning the influence on the motivations of farmers to participate. It additionally will be assessed if those initiatives might be transferred from one country to another to answer RQ3. The operationalization of this research will then be formalized in the Methodology section.

2.1 Characterizing the Governance of Wild Pollinators: Mode of Governance Framework

Today, there is an increasing involvement of many different stakeholders in decision-making processes. This can be observed for several topics but especially in environmental governance concerning environmental issues such as climate change and biodiversity loss (Driessen et al., 2012). This shift has also been described as a move from government to governance (Ambrose-Oji et al., 2017). The concept of governance first emerged as a concept in political and sustainable sciences as a response to the realization that there are increasing numbers of relevant actors, especially concerning the management of societal issues. Scholars have argued that governance now is a shared responsibility of the state, the market and the civil society (Lange et al., 2013). Generally, governance can be characterized as arrangements, which refers to certain combinations of objectives and actors and the way they influence and interact with one another. These interactions can either be *top-down*, when public actors are in the dominant role; *horizontal*, when public actors, companies and NGOs interact with each other or *bottom-up*, when companies and NGOs are in leading positions (Runhaar et al., 2017). Hence, governance concerns the solving of issues collectively through government regulations, privatization and self-governance (Driessen et al., 2012). Governance arrangements are usually

characterized by complex multi-actor interactions, and they usually occur at multiple levels (Lange et al., 2013).

Driessen et al. (2012) have developed a framework that distinguishes between five ideal-typical modes of governance (Table 1). These modes are mapped on a continuum that represents the amount of involvement of state and non-state actors (Lange et al., 2013; Figure 1).

Name of Mode	Explanation
Centralized	Actors of the public are the main or only actors. In both modes (centralized and decentralized) either the government (either central, regional or local) is the decision-maker and the market and civil society are the recipients of the incentives brought by the government.
Decentralized	Actors of the public are the main or only actors. In both modes (centralized and decentralized) either the government (either central, regional or local) is the decision-maker and the market and civil society are the recipients of the incentives brought by the government.
Public-private governance	Public-private governance is characterized by the combined efforts of actors from the public and private domain, the corporation however is mostly focused between the government and market actors.
Interactive governance	Interactive governance is characterized similar to the third. It is focused on the base of actors that are broader and that governments, market and civil society collaborate on equal terms.
Self-governance	Self-governance is characterized by actors of the private domain that aim to achieve their environmental goals based on private initiatives and investments. With this the market and civil society have greater autonomy. However, usually a certain amount of regulations by the central government will be required

Table 1: Five modes of governance

Source: Driessen et al. (2012)

However, it is important to mention that these ideal-typical governance modes and the complex real-world modes must be distinguished. Real-world modes are usually hybrids (i.e., a mix of ideal-typical modes). Hence, the ideal-typical modes should not be seen as fixed and inflexible (Lange et al., 2013; Driessen et al., 2012).

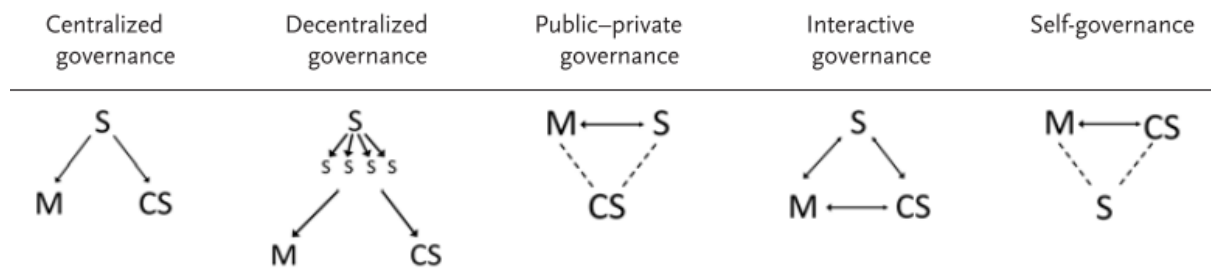


Figure 1: Modes of governance: S: state actors; M: market actors; CS: civil society actors

Source: Driessen et al. (2012)

Therefore, due the ability to identify the involvement of state and non-state actors, the framework creates an overview that will serve as a foundation for the IA. Additionally, Driessen et al. (2012) have set key features for each mode of governance to recognize them in real-world initiatives and to compare potential shifts. They furthermore divided the key features into three dimensions, namely (1) actor features; (2) institutional features and (3) features concerning policy content (see Table 2).

Dimensions	Features
Actor features	<ul style="list-style-type: none"> - Key public actors - Position of other stakeholders - Predominant policy level at which key actors operate - Formal and/or informal basis of power of the key actors
Institutional Features	<ul style="list-style-type: none"> - Model of representation - Formal and/or informal rules of exchange and interaction - Mechanisms of social interaction
Features concerning Policy Content	<ul style="list-style-type: none"> - Types of Goals - Policy Instruments - Type of knowledge that is used for policy preparation, decision-making, implementation and evaluation - The extent to which policies are integrated or not

Table 2: Dimensions and key features in modes of governance

Source: Driessen et al. (2012)

To answer RQ1 – *How, by whom, and with what objectives is wild pollinator conservation in agricultural landscapes governed in Germany and England?* – not all proposed features by Driessen et al. (2012) have been analyzed in the identified initiatives. Since this research question focuses on identifying what the governing tools are (i.e., how the goals are implemented, who the main actors in the determined arrangements are, and what the main goals are), this analysis thus emphasizes the actor features and the features concerning policy content to answer this question.

This mode of governance framework was created, amongst other reasons, to assess shifts in governance (i.e., paradigm shifts), which makes it essential for examining all three dimensions (Driessen et al., 2012). However, since the scope of the research is to assess the current situation with a focus on main actors and policy content features and not changes over time, the institutional features have been neglected.

This framework is helpful for this thesis because it provides a differentiated picture and is thus a suitable heuristic device (Lange, 2015) to analyze wild pollinator protection governance arrangements. Hence, with the ideal types of the modes of governance framework, the characteristics of the wild pollinator protection initiative can be described explicitly and clearly. Thus, it can capture the complexity of the governance discourse (Lange et al., 2013). Furthermore, it helps identify the state, market and non-state actors' involvement in the wild pollinator protection. The five modes of governance can assess complex, multi-scale, cross-sectoral and long-term sustainability-related topics, such as the pollinator decline. Additionally, it allows for assessing the outcomes of the governance arrangements (i.e., governance outputs and their impacts) by evaluating the goals actors have agreed on (Lange et al., 2013), which is the objective of RQ1.

2.2 Assessing the Perceived Effectiveness of Wild Pollinator Governance Arrangements: Indirect Impact Assessment

Effectiveness is understood as the degree of success of, for example, a pollinator protection initiative towards objectives, such as the creation of habitat, which motivated its establishment. Effectiveness is mostly seen in terms of *outputs*, which includes rules and regulations; *outcomes*, which includes behavioral changes; and *impact* (Rosendal & Andresen, 2011). In this thesis, to answer RQ2 – *How effective are governance arrangements in England and Germany, and what motivates farmers to adapt their practices to participate?* – the outputs (i.e., the wild pollinator protection governance arrangements) in Germany and England are assessed based on the outcomes. The outcomes in this thesis are mainly the motivation and barriers of farmers to participate in governance arrangements and implement wild pollinator protection and enhancement measures on their farms and fields. This is elaborated on in the methodology section.

IAs are used to evaluate if programs or initiatives produce the intended effect compared to what would have happened without the interference of a policy. IAs can be applied to policy

at multiple phases, including policy formation, pilot testing, implementation and ongoing monitoring. Furthermore, IAs are deemed an important part of good governance, and they are essential for sustainable development (Nooteboom, 2007).

The motivation for using an IA is the expectation that the results of a study will be used to improve policies and programs and thus increase economic and social well-being (Mackay & Horton, 2003). Mackay and Horton (2003) indicate that an IA can be used as an evaluation tool to generate information to help analyze governance arrangements. In this research, an ex-ante evaluation and thus, not the policy effects concerning ecological effects, were assessed, but the perceived impact of the arrangement connected to the motivation of farmers to participate and implement measures was done (Runhaar, Dieperink, & Driessen, 2006). Therefore, IA is a systematic approach that allows policymakers to work with the input of multiple actors and to deal with complexity (Huge et al., 2011).

Additionally, Rossi et al. (2004) mention four stages that can be identified while conducting an IA:

- (1) Specification of variables, which are measures such as policy goals
- (2) Selection and elaboration of a specific research design (experimental or quasi-experimental etc.)
- (3) Operationalization of variables and measurement
- (4) Interpretation of data (i.e., explanation of the findings etc.)

For this thesis, policy goals, main actors and policy instruments are assessed (RQ1) (stage 1) and the quality, scope, motivation, demand, ability and legitimacy (Runhaar et al., 2017). Additionally, different findings are discussed and connecting to secondary literature (stage 4).

In theory, there are two main ways of doing an IA. The first method is a randomized field experiment. These experiments are often considered the “golden standard” to assess causal effects, whereby participants are randomly placed into two different groups, the control group and the intervention group, which is given the intervention (Rossi et al., 2004). The second method is a non-randomized quasi-experiment. With this, participants on the program are compared to nonparticipants who are similar to the participants in some essential ways that have to be set before looking for participants and non-participants. Thus, these experiments do

not have a random assignment to conditions (Rossi et al., 2004). In quasi-experiments, the treatment status is often determined by politics, nature and an accident of another action, which lies beyond the control of the researcher and is often seen as critical (Greenstone & Gayer, 2009). However, Runhaar, Dieperink, and Driessen (2006) mention that randomized experiments, are often not possible to conduct due to time constraints and financial means. This is also the case for this thesis. Additionally, based on the goal of this research question, only an indirect IA can be conducted, with no intervention group focused on the perceived impact

To assess the perceived effectiveness of wild pollinator protection initiatives, Runhaar et al.'s (2017) framework was used. The governance arrangements have been firstly assessed based on their objectives. The objectives are assessed based on the initiatives scope (i.e., the number of farmers targeted) and on qualitative terms including the ambiguousness of the initiatives and the difficultness to achieve their goals (Runhaar et al., 2017).

Additionally, Runhaar et al. (2017) propose that the performance of governance arrangements depends on four conditions (see Figure 2): (1) the motivation of farmers to participate in pollinator protection initiatives, (2) their ability to do so, (3) demand (i.e., in how much farmers are obligated to participate) and (4) legitimacy (i.e., the extent to which farmers are allowed to participate).

This framework is helpful to evaluate the conditions needed for farmers and a detailed assessment based on which condition is fulfilled or which one is lacking could be given; thus, it helped to establish why an initiative is considered effective or where an initiative can still improve.

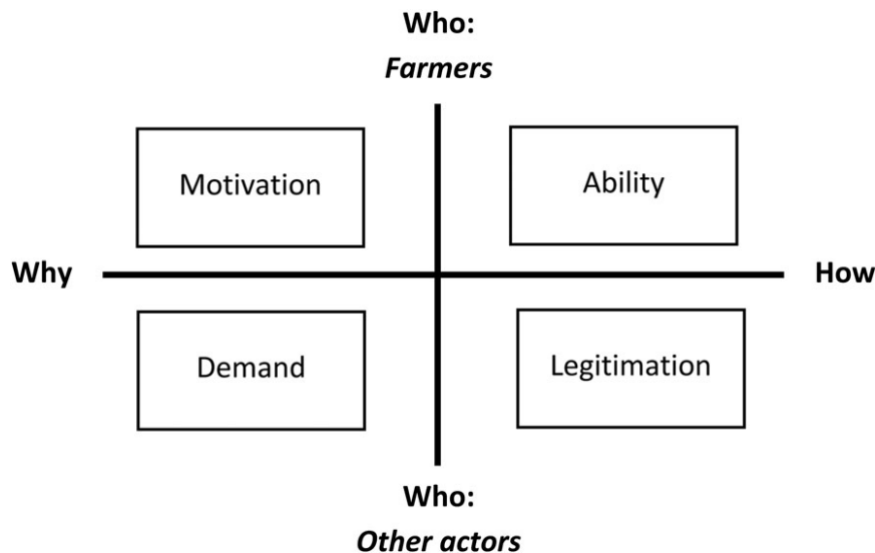


Figure 2: Proposed conditions for farmers to implement governance arrangements
Source: Runhaar et al. (2017)

Some studies across Europe have been taken place to identify the motivation of farmers to implement biodiversity protection measures. A study by Joormann and Schmidt (2017) analyzed how economically valuable and realistic some measures for farmers are to implement in their farms to increase biodiversity, in Germany. The authors found that the effectiveness of the measures strongly depends on the amount and variety of animals targeted, the acceptance of the measures by farmers and the planning of implementation. Furthermore, Defrancesco et al. (2008) undertook a similar study in Italy, Herzon and Mikk (2007) in Finland and Estonia, and Villanueva et al. (2015) in Spain.

All authors identified that the motivation of farmers to adopt new measures often depends on economic factors, such as reimbursement or financial attractiveness. They also identified that personal reasons could influence farmers' motivation, such as the interest in doing “something” for the environment. Lastly, they determined that soft factors may affect farmers' motivation, such as “doing what society asks of them”; opinions and experiences of other farmers and the landowners' opinion also seem to be of importance (Herzon & Mikk, 2007; Defrancesco et al., 2008; Villanueva et al., 2015; Joormann & Schmidt, 2017).

However, none of these studies focus specifically on measures that benefit wild pollinators. Furthermore, the research of farmers' perception of pollinators was not undertaken in Germany or England. Therefore, even though the identified motivations cannot be transferred to other situations and countries, they can be used as a point of guidance in this research.

However, Nooteboom (2007) mentions that there are some doubts about IAs since policymakers possibly understand them as bureaucracy because IAs are very time consuming

and need a lot of preparation. Additionally policymakers often assume that they can assess for themselves when an IA is required and thus the opinion of policymakers about them is often low and the results sometimes not taken serious. Furthermore, Mackay and Horton (2003) criticize that if the results of an IA show that the desired effects have not been achieved, it is very difficult to assess if the fault lies within the policy, the implementation process or in the program itself. This criticism is taken into account in this thesis.

2.3 Transfer of the most Effective Mode of Governance and Initiative: Policy Transfer and Lesson Drawing

An increasing interest in political science and international studies has occurred in the use and analysis of lesson drawing (LD) and policy transfer (PT) (Dolowitz & Marsh, 2000). LD and PT focus on if and how knowledge, initiatives and policies from one political setting can be transferred to another even though their specific focuses and terminologies differ (Dolowitz & Marsh, 2000). In many countries, the concepts of PT and LD are increasingly used to understand public policy (James & Lodge, 2003).

The terms *lesson drawing* and *policy transfer* are often used interchangeably, as is the case with Rose (1991). However, some other authors, such as Dolowitz and Marsh (1996), argue that these terms cannot be used interchangeably. They argue that LD focuses on voluntary PT in which political actors and decisionmakers draw lessons from one or more countries and apply these lessons to their political system (Dolowitz & Marsh, 1996). However, the concept of LD has often been criticized for the assumption that the process of learning a lesson is rational and voluntary (Benson & Jordan, 2011). PT, however, covers voluntary and coercive PT (Dolowitz & Marsh, 1996). It is understood that PT is a process in which the learnings (i.e., the ideas, knowledge, administrative arrangements and institutions of a political system) are used to create a similar policy in another political background (Peck & Theodore, 2010). These lessons can be drawn from past or present political systems (Benson & Jordan, 2011). However, even Dolowitz and Marsh (1996) use the term lesson drawing because often lessons are learned without resulting in policy or institutional change (Benson & Jordan, 2011). In this thesis, the term LD is used to describe lessons that can be learned from the specific cases in Germany and England for wild pollinator governance. PT is used to assess if the most effective initiative could be transferred to the other country. However, a focus is placed on possible lessons that can theoretically be transferred voluntarily and coercively.

Dolowitz and Marsh (2000) identified eight categories that can be transferred from one political system to another:

- policy goals
- policy instruments
- policy content
- policy programs
- institutions
- ideologies
- ideas and attitudes
- negative lessons

Additionally, they argue that policy makers can examine three different levels of governance to draw lessons from the international, national and local levels. Lessons do not only involve learning within but also across these levels (Dolowitz & Marsh, 2000). Dolowitz and Marsh (2012) further argue that the concept of PT can be used together with other concepts, such as governance, especially the connection between PT of governance arrangements with different modes of governance. Dolowitz and Marsh (2012) argue that PT might have different levels of success but also different approaches based on whether they are governed more centrally or interactively. It would thus be possible to see differences in which governance mode is prevailing in one country and how that could affect the process of PT (i.e., whether it is a top-down or a bottom-up approach). Therefore, who is involved and how they are involved in a possible PT seems to be important (Dolowitz & Marsh, 2012).

Furthermore, lessons that can be learned are not always positive (i.e., in respect of governance arrangements and practices that are effective in one country and are thus interesting to transfer). They can also be negative, in the sense that lessons can be learned from mistakes that other countries have made, for example, what they have done in the past that was not considered effective (Rose, 1991).

Rose (1991) identified five ways of how to draw lessons, depicted in Table 3.

Name	Explanation
Copying	Copying implies that most of a program in one country is just copied the way it is and implemented in another country.

Emulation	Here adjustments are made to better fit with the circumstances prevailing in the country in which it will be implemented.
Hybridization	Hybridization combines different elements from programs of two different countries
Synthesis	In synthesis, familiar elements are put together from three or more different places
Inspiration	Inspiration can be drawn from programs elsewhere and be used as a base for new programs

Table 3: Five ways of how to draw lessons
Source: Rose (1991)

For a successful PT, it is critical to examine the goals of the PT initiative, to examine how this transfer would be governed, to list the involved actors and to have a list of the target recipients and the policy areas and practices. This also includes the intended gains for both countries (Dąbrowski, Musiałkowska, & Polverari, 2018). It is also essential to understand the uniqueness of any city/state or country where there is an intention to transfer policy to and from and to acknowledge their geographic settings, political situation and socio-economic status (Chan et al., 2018). It is thus important that the transferring political system has the economic, bureaucratic and political resources to implement the policy (Dolowitz & Marsh, 1996). Robertson & Waltman (1992) states that the PT is more likely to be successful if the policy is similar to the main political ideology in the transferring country. Dąbrowski, Musiałkowska, and Polverari (2018) argue that the social and political context has to be assessed before PT considerations can be made. For example, a large geographical distance between two countries will make a successful PT difficult as there will be too many barriers and thus the transferability is decreased (Benson & Jordan, 2011; Dąbrowski, Musiałkowska, & Polverari, 2018).

However, some scholars question the relevance of PT and LD, since there is no actual tangible outcome evidence (Dąbrowski, Musiałkowska, & Polverari, 2018). It is furthermore said that LD and PT are difficult to distinguish from other concepts since PT is broader in scope than LD, and it is thus difficult to say how important PT is in comparison with other policymaking strategies (James & Lodge, 2003).

This research focuses on positive and negative lessons that can be learned from either Germany or England. Additionally, it assesses whether the most effective governance

arrangements could be transferred from one country to the other considering their unique geographical, socio-economic and cultural backgrounds.

3 Methodology

To conduct this analysis, this research uses a mixed methods approach, which consists of an exploratory, inductive qualitative approach and a conceptual approach. Qualitative exploratory research can produce holistic understandings of the meanings and experiences of people's lives and social worlds, including experiences, interactions, behaviors and social contexts (Fossey et al., 2002). Since the emergence of wild pollinator protection initiatives are contemporary, an exploratory focus of this qualitative research appears to be appropriate. This research also uses a partly conceptual approach because it analyzes already given information on governance arrangements and wild pollinator decline, and it focuses on the concept of effectiveness interweaved with an explicit theoretical framework, with a strong focus on the observation of farmers and experts and the analysis and interpretation of them (Leuzinger-Bohleber & Fischmann, 2006; Radaelli & Pasquier, 2008).

A key aspect of this research is to understand the emic perspectives (i.e., the perspectives of the participants of the wild pollinator protection initiatives) and motivations for participation (Merriam & Tisdell, 2015). This research has an inductive perspective since data is gathered to build a hypothesis (Merriam & Tisdell, 2015) on which mode of governance prevails, on what motivates farmers to participate and on which initiatives are most effective. To understand the farmers' motivation, this research relies on an interpretive paradigm from farmers' experiences and actions (Fossey et al., 2002). This means that the results of this analysis are not to be used for generalization to a wider population (Ponelis, 2015).

Furthermore, a holistic multiple comparative case study design is used. Case studies are useful because they can give the researcher the opportunity to investigate a contemporary phenomenon, such as the emergence of wild pollinator protection initiatives, in its own context (Rowley, 2002). Since this research is embedded in theory, generalizations of the case studies have been secured, and the findings extend existing theories. However, the results of this research are specific for the two case studies, except the lessons that can be learned, which could be used as a primary starting point of new research in other countries.

Case studies are often considered less reliable due to subjectivity bias. This decreases the representativeness of case study research (Merriam & Tisdell, 2015). To decrease bias and increase the validity and reliability of this research, method and data triangulation have been used (Mathison, 1988). Thus, information mentioned in the interviews conducted with farmers is backed up and compared with secondary literature. Due to the data triangulation,

inconsistencies among the data might occur (Mathison, 1988). When contradictions or inconsistencies occurred in the interviews, both opinions and statements were listed. In some cases, farmers used different words to describe the same measure or issue. To recognize this, a table for the IA was created (Appendix A **Error! Reference source not found.** & B **Error! Reference source not found.**). Furthermore, after every interview, the main messages in the old and new interviews were compared, and similar statements were grouped (Antin, Constantine, & Hunt, 2015). If inconsistencies occurred between the interviews and literature, the researcher looked for indications of misinterpreted aspects in the recorded interviews and checked if the inconsistencies might be an unexamined topic in the literature. The researcher then provided a possible explanation.

The unit of analysis in this research is the modes of governance in wild pollinator protection in Germany and England. The reasons for choosing this unit of analysis is justified below. Furthermore, due to time constraints, only governance arrangements for the protection of wild pollinators after 2000 have been considered.

3.1 Case study

Case studies are a research strategy focused on understanding and explaining the dynamics in one or multiple settings (Eisenhardt, 1989). The case studies in this research are used to build a theory on which modes of governance are prevailing in which country and what seems to be effective. This provides an intensive and holistic description of the real-life situation in each country (Ponelis, 2015).

3.1.1 Germany

Germany was chosen for this research because it has national funds for pollinator projects and different foundation-funded projects in major cities, such as Hamburg in northern Germany (Underwood, Darwin, & Gerritsen, 2017). Germany faces many problems, such as biodiversity loss, pollution of groundwater and an increase in agricultural landscapes, which impact pollinators (Marggraf, 2003). The German government reacted to these issues in 2003 by implementing agricultural environmental policy measures using legal and economic instruments. These programs differ considerably between the German federal states. Some governance arrangements have a simple structure with one main goal, such as the creation of habitat, and only a couple of policy instruments. However, Germany appears to have many top-down governed initiatives, which are very comprehensive concerning their target goals and

policy instruments. Comprehensive not only connected to control whether measures are implemented correctly but also to make sure that reporting from the initiatives happens regularly and timely (Marggraf, 2003; Kleijn et al., 2006). Most initiatives in Germany are driven by the government and are often focused on honeybees and not on wild pollinators. Wild pollinator initiatives, however, are focused on raising awareness and setting rules (often mandatory) for farmers to implement, such as decreasing the use of certain pesticides or planting flower strips as a source of food and habitat for pollinators (Underwood, Darwin, & Gerritsen, 2017). However, there is currently no national pollination initiative plan. There is only an NGO-developed proposal for such a plan for wild pollinators, but it has not yet been approved. Thus, Germany as a case study was selected because it appeared to have a centrally governed approach to enhance the abundance and diversity of pollinators, and it uses many mandatory measures for farmers.

3.1.2 England

England was chosen because it has a National Pollinator Strategy (2014–2024), which addresses managed and wild pollinators. In England, the government has small budgets for regional and local projects (Underwood, Darwin, & Gerritsen, 2017), and it focuses on the creation of a more participatory climate for policy development and deployment. Thus, it is trying to include a range of stakeholders in the policy process who have various expertise (Maderson & Wynne-Jones, 2016). The regional pollinator strategy is based on the main challenges and pressures for different stakeholder groups, locations and the main reasons pollinators decline in the different areas.

Compared to Germany, England has multiple NGO-based initiatives that educate farmers on creating habitat for pollinators. There are also initiatives created in an alliance of NGOs and the government to protect wild pollinators. Many of these initiatives in England are voluntary for farmers to implement (Underwood, Darwin, & Gerritsen, 2017). Thus, it is interesting to compare Germany, which appears to have a more centralized mandatory approach to England's more interactively voluntary approach, and to assess and compare the effectiveness of these different strategies in regard to the motivation and uptake of them to protect wild pollinators.

3.2 Data Collection and Analysis

The following sections will detail the data-collection and analysis processes.

3.2.1 Characterizing the Mode Governance of Wild Pollinators Protection

To answer RQ1 – *How, by whom, and with what objectives is wild pollinator conservation in agricultural landscapes governed in Germany and England?* – a literature review was undertaken on current wild pollinator governance arrangements, their main goals, their main actors, their policy instruments and their mode of governance.

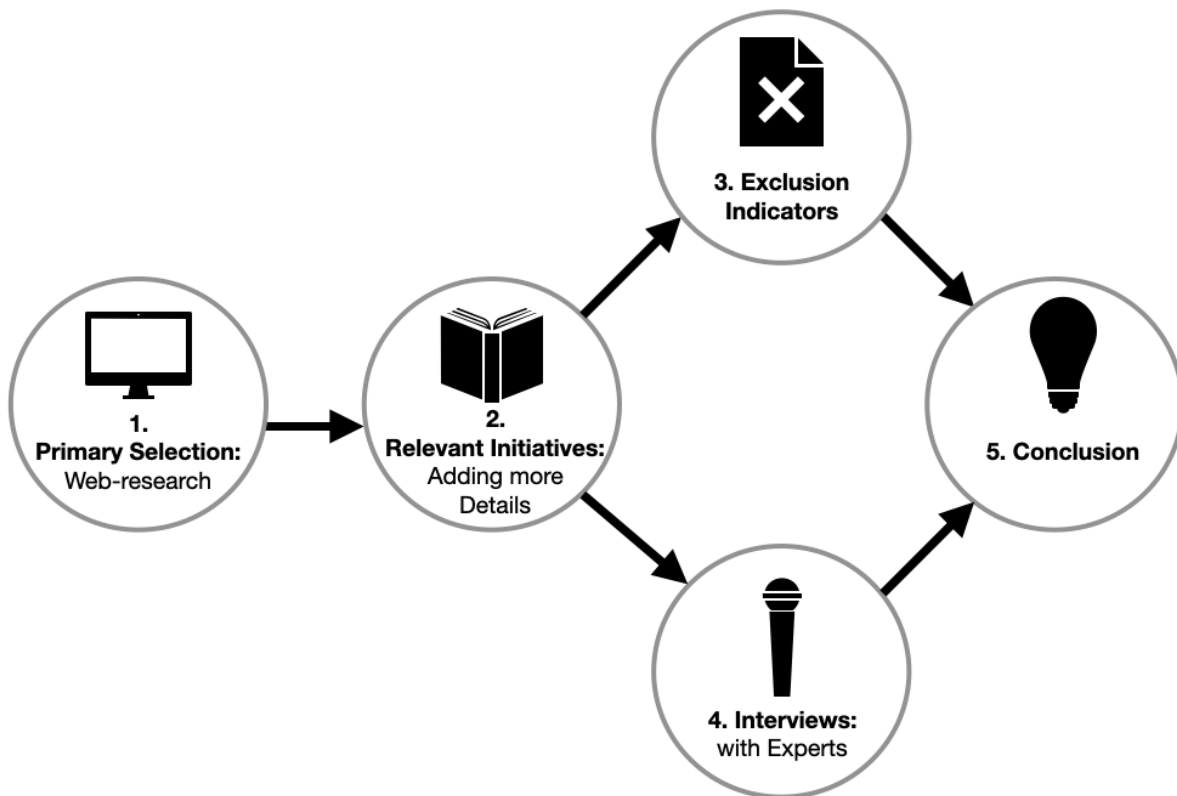


Figure 3: Steps followed to answer RQ1

Source: Own creation

Five steps, as depicted in Figure 3, were followed. First, a primary selection of potentially interesting initiatives in Germany and England was undertaken. This relied on the snowball effect. While reading about one initiative, umbrella initiatives and other projects were often mentioned. In this first step, the first two indicators (see Table 4) were used, which excluded all initiatives that were established before 2000 and are not focused on agricultural landscapes and are thus not relevant for this research. Using these indicators, 11 relevant initiatives were found in England, and 20 relevant initiatives were found in Germany.

Second, more information was gathered about the initiatives through web research. Additionally, four more indicators were added to reduce the number of relevant initiatives for this research. The third indicator was set to only include initiatives that actively target wild

pollinators. The focus on wild bees and insects was also satisfactory, since wild bees in Germany are often considered the most prominent and important pollinators.

Third, since the motivation and also barriers for farmers are relevant in this research all initiatives not specifically targeting farmers were excluded. Furthermore, it seemed to be relevant that the farmers “receive” some kind of tangible output from the initiative, such as guidelines or incentives. Thus, initiatives that were only focused on research and knowledge distribution were excluded. Moreover, initiatives created by an umbrella organization were combined, and thus three relevant initiatives were identified for both countries.

Indicators	Identified initiatives in England	Identified initiatives in Germany
Indicator 1: Start of the initiative was no later than 2000 and has a strong emphasize on agricultural land (<i>Beginning Indicators</i>)	11	20
Indicator 2: The initiative focuses on farmers and not just on agricultural land in general (<i>Yellow-Indicator</i>)	11	16
Indicator 3: Initiative focuses on wild pollinators (wild bees and insects are also okay) (<i>Blue- Indicator</i>)	8	12
Indicator 4: The initiative is still running in 2021 (<i>Purple-Indicator</i>)	6	10
Indicator 5: There is a tangible output for farmers e.g. guidelines or incentives (<i>Pink-Indicator</i>)	3	4
General: connected initiatives were put together i.e. if an umbrella organization created another project/initiative with similar goals (<i>Green-Indicator</i>)	3	3
Sum of Identified Initiatives	3	3

Table 4: Used indicators to reduce the number of relevant initiatives

Source: Own creation

Fourth, to triangulate the findings, three semi-structured interviews in Germany (see Appendix C **Error! Reference source not found.** for interview guide Germany) and two in England (see Appendix D **Error! Reference source not found.**) for interview guide England) were conducted with experts in the field. Semi-structured interviews were used to detail the previously identified initiatives but also to explore other, perhaps newer, governance arrangements not detected by the researcher (Cavaco, Dias, & Bates, 2005). The experts were chosen with the help of indicators, created by the researcher, listed in Table 5.

Number	Indicator	Comment
1	Based in Germany or England	-
2	Research/expert on wild pollinators	-
3	Works in an institute connected to research does not have to be at a university it can be a bee institute etc.	-
4	Neutral, cannot work for one of the identified initiatives	To decrease bias
5	Knowledge about the decrease of pollinators in agriculture	-
6	Knowledge about governance/policy connected to land-use change and wild pollinators (ideally)	This indicator was used to establish which expert to contact first i.e. the ideal expert (wild bee expert / agricultural land use/change expert /plus governance/policy background

Table 5: Indicators to identify relevant experts

Source: Own creation

An individual was considered an expert if s/he either undertook research on wild pollinators, the decline of wild pollinators connected to agricultural practices or have practical work experience in this field. Additionally, it was considered a criteria if the identified experts had experience with governance and policy related to the decline of wild pollinators and land-use change.

In Germany, 13 experts were identified and contacted via email. Three experts responded, and an approximately 45-minute interview was scheduled in Microsoft Teams or on Zoom. Due to Covid-19, no in-person interviews could be conducted. The interviews were recorded and a summary of the key messages were created. Those summaries were sent back to the expert, who was then asked to add or change information if necessary and give their feedback. The respondents were asked to validate the information to check for inconsistencies and to decrease any chances of bias that the research might have had (Anderson, 2010). A list of contacted experts can be found in the Appendix (Appendix E **Error! Reference source not found.**). Table 6 shows the interviewed experts in Germany. All experts from Germany and England agreed to be mentioned by name in this thesis.

Number	Name	Profession	Why chosen?
Expert 1	Annik Dollacker	Senior Expert in Regulatory Policy at BAYER (responsible for biodiversity and ecosystem services in regulatory policy)	- Knowledge about agricultural policies - Knowledge about pollinator initiatives in agricultural landscapes in Germany

Expert 2	Dr. Frank Jaucker	Post-doctoral researcher at the University of Giessen in Germany. His previous research covered landscape ecology and pollinator ecology	- Specific knowledge about pollinators and pollinator needs in agricultural landscapes
Expert 3	Dr. Rheinhold Siede	Researcher at the bee institute Kirchhain, Hessen. His research and projects mainly focus on honey bees. He worked on pathogens of the honeybee and the importance of pesticides for all bees.	- Knowledge about differences in needs for honey bees and wild pollinators - Knowledge about the effects of pesticides on pollinators

Table 6: Interviewed experts Germany

Source: Own creation

In England, 12 experts were identified and contacted through email (Appendix F **Error! Reference source not found.**). Two interviews with experts were scheduled through Microsoft Teams. Table 7 shows the interviewed experts in England, their profession and why they were chosen.

Number	Name	Profession	Why chosen?
Expert 1	Dr. Michael Garratt	Senior Research Fellow. He focuses on invertebrate ecology in the agri-environment and primarily the impacts of farming practice and land management on the ecosystem services of pest control and pollination underpinning crop production.	- Knowledge in the impact of different farming practices on pollinators and crop production
Expert 2	Tom Breeze	Research fellow in ecological economics. He focuses on economic and social impacts that ecological changes have. Works with Stakeholders like DEFRA and EU.	- Knowledge in farmer oriented initiatives in England to improve biodiversity - Connections to interesting stakeholders such as Defra

Table 7: Interviewed experts in England

Source: Own creation

The information from the interviews was used to understand if a mode of governance is prevailing in one country and if an important initiative had been missed. Furthermore, similarities and differences between the initiatives were discussed in regard to their main actors, main goals and policy instruments. Additionally, in the interviews, the experts were questioned about the motivation and barriers for farmers. Those information were later used for the IA.

3.2.2 Assessing the Perceived Effectiveness of Wild Pollinator Governance Arrangements

To answer RQ2 – *How effective are governance arrangements in Germany and England, and what motivates farmers to adapt their practices to participate?* – an indirect IA

was performed, which was focused on the perceived impact of farmers. For the analysis, three assessments were undertaken based on the approach by Runhaar et al. (2017).

First, a tentative assessment of the theoretical impact of the governance mode was undertaken based on the *scope* of the initiative (i.e., how many farmers are targeted) and the *quality* (i.e., the ambition levels of the objectives; see Figure 4). Criteria to assess the quality and the scope of the research was created by the researcher to assess whether the scope and quality is high, moderate or low (see Table 10 for the criteria).

Secondly, a tentative assessment of the actual impact of the governance arrangements was done by analyzing four proposed conditions by Runhaar et al. (2017) to see how many farmers will participate and implement measures. The four conditions are farmers' *motivation* to participate in the initiatives, the *demand* of the initiatives, the farmers' *ability* to participate in the initiatives and the *legitimization* of the initiative (see Figure 4). There are multiple factors that can influence these conditions, including factors from governance arrangements, context and characteristics of the farmers. Table 9 details the operationalization of these conditions and which factors can be influential.

To assess how fulfilled (high, moderate-high, moderate, moderate-low or low) the conditions are in the different initiatives, criteria were developed by the research also for those conditions (Table 10). The explanation of the achieved score can be found in Table 8. For the quality and scope assessment, fulfillment was only assessed to be either high (2 points), moderate (1 point) or low (0 points).

Fullfillment	Explanation
High	<ul style="list-style-type: none"> The assessed condition received 2 points on the impact assessment. <i>All</i> criteria mentioned in table 10 were fulfilled (detailed assessment including experts and farmer statement can be found in Appendix A Error! Reference source not found. for Germany; and B Error! Reference source not found. for England.
Moderate-High	<ul style="list-style-type: none"> The assessed condition received 1.5 points on the impact assessment <i>Most</i> of the criteria mentioned in table 10 were stated to be fulfilled by the farmers and or experts
Moderate	<ul style="list-style-type: none"> The assessed condition received 1 point on the impact assessment

	<ul style="list-style-type: none"> • <i>Many</i> of the criteria mentioned in table 10 were stated to be fulfilled by the farmers and or experts
Moderate-Low	<ul style="list-style-type: none"> • The assessed condition received 0.5 points on the impact assessment • <i>Some</i> of the criteria mentioned in table 10 were stated to be fulfilled by the farmers and or experts
Low	<ul style="list-style-type: none"> • The assessed condition received 0 points on the impact assessment • <i>None/almost none</i> of the criteria mentioned in table 10 were stated to be fulfilled by the farmers and or experts

Table 8: Explanation of achieved score
Source: Own creation

Additionally, the third assessment identified theoretical barriers and motivations (Table 12). These were used as a starting point to compare mentioned barriers and motivation by farmers, to check for inconsistencies and to evaluate if other conditions were necessary to add. The whole process is visualized in Figure 4. The information gathered in the desk research especially influenced and backed up the motivation condition. However, the ability condition was also influenced, mostly based on the barriers mentioned in the literature.

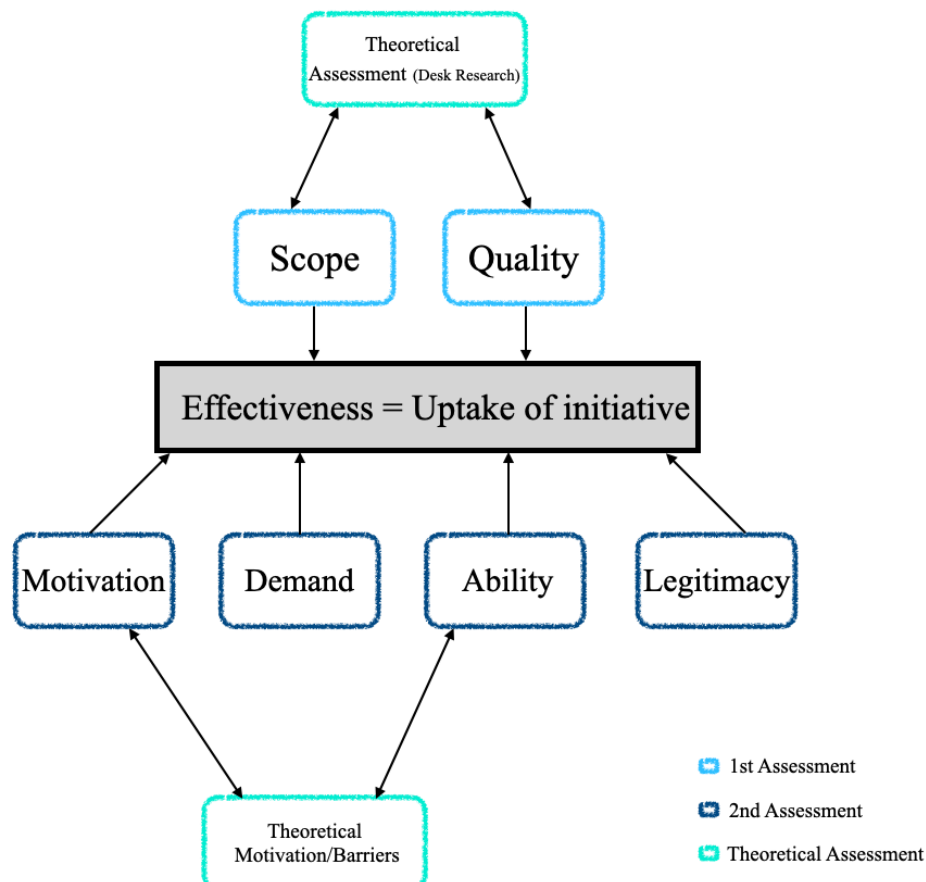


Figure 4: Visualization of IA

Source: Own creation based on Runhaar et al. (2017)

Additionally, desk research about the initiatives was undertaken and added in the IA where necessary, especially to assess the scope and quality of the initiative.

Condition	Operationalization	Influencing Factors
Motivation	How far are farmers motivated to participate in wild pollinator protection initiatives?	<p><i>Governance arrangements:</i> Rewards; cooperation's; visible results</p> <p><i>Context:</i> Cost-benefit ratio; social capital; natural background (i.e. their fields); behavior of other farmer and recognition of close by citizens</p> <p><i>Characteristics:</i> Intrinsic motivation; education; farming style; training and education; interest; enjoyment; satisfaction</p>
Demand	How far are farmers obligated to participate?	<p><i>Governance arrangements:</i> Environmental market regulations; contracts with customer; pressure from NGOs; consumer strategies</p> <p><i>Context:</i> Public opinion; other policies; social capital</p> <p><i>Characteristics:</i> Economic considerations; religious values</p>
Ability	Do farmers have the resources and skills to participate?	<p><i>Governance arrangements:</i> Resources made available such as time and money; communities of practice; learning</p> <p><i>Context:</i> Physical opportunities or restrictions; market conditions; support from NGOs</p> <p><i>Characteristics:</i> Competences; knowledge; farming style; farm economy; finance</p>
Legitimization	Are farmers allowed to participate in wild pollinator protection initiatives?	<p><i>Governance arrangements:</i> Degrees of freedom within contracts with customers or in legislation; strictness of legislation and standards</p> <p><i>Context:</i> Prevailing social norms; room for changing legislation</p> <p><i>Characteristics:</i> Norms within the sector like group pressure; cultural setting; social control; innovativeness</p>

Table 9: Operationalization and influencing factors of conditions

Source: Runhaar et al. (2017)

Performance	Criteria “High”	Criteria “Medium”	Criteria “Low”
Scope	<ul style="list-style-type: none"> Addresses most farmers in the country Considers differences in farming style 	<ul style="list-style-type: none"> Address larger number of farmers In some parts, measures can be adjusted based on the farming style of a farmer 	<ul style="list-style-type: none"> Small ambitions of targeted farmers Does not consider differences between farmers
Quality	<ul style="list-style-type: none"> Compensation for farmers is given Established positive effect on wild pollinators Benefit for farmers Farms motivation is high to implement measures and perhaps expand them Clear goals and update on the achievement 	<ul style="list-style-type: none"> Compensation is limited Motivation of farmers is higher but they are facing some restrictions Clear goals but no updating plan 	<ul style="list-style-type: none"> Requirements are soft and thus a low effect on pollinators and for the farmers are to be expected Low motivation of farmers to participate Bottlenecks identified in demand Enforcement of the measures are low Goals of the initiative are not stated clearly or very average

Condition	Operationalization	Influencing Factors	Criteria “High”	Criteria “Moderate”	Criteria “Low”
Motivation	How far are farmers motivated to participate in wild pollinator protection initiatives?	<p><i>Governance arrangements:</i> Rewards; cooperation’s; visible results</p> <p><i>Context:</i> Cost-benefit ratio; social capital; natural background (i.e. their fields); behavior of other farmer and recognition of close by citizens</p> <p><i>Characteristics:</i> Intrinsic motivation; education; farming style; training and education;</p>	<ul style="list-style-type: none"> Farmers mention that they see visible results, that they have a benefit They are planning on continuing with those measures and perhaps even adapt new ones Intrinsic motivation included such as making family happy, showing that farmers are not bad per se Willingness to adapt measures for endangered pollinators in the area even 	<ul style="list-style-type: none"> If there is enough of a benefits farmer are willing to implement measures Willing to add additional measures when compensated properly 	<ul style="list-style-type: none"> Farmers do not see a purpose of pollinator protection and do not need pollinators in their field and thus do not have a perceived benefit on their farm There is no or almost no motivation to implement measures Measures are only implemented under the CAP pillar

Condition	Operationalization	Influencing Factors	Criteria “High”	Criteria “Moderate”	Criteria “Low”
		interest; enjoyment; satisfaction	though farmers are not depended on pollinators		
Demand	How far are farmers obligated to participate?	<p><i>Governance arrangements:</i> Environmental market regulations; contracts with customer; pressure from NGOs; consumer strategies</p> <p><i>Context:</i> Public opinion; other policies; social capital</p> <p><i>Characteristics:</i> Economic considerations; religious values</p>	<ul style="list-style-type: none"> • Participation is mandatory • Consumers/civil society urge for action immediately • Requirements for farmers are very strict • The initiative is complex 	<ul style="list-style-type: none"> • Participation is voluntary however if farmers participate they are bound on some requirements • There is a societal pressure to participate 	<ul style="list-style-type: none"> • Participation is voluntary and there are no or almost no requirements that need to be followed • Low societal pressure to participate
Ability	Do farmers have the resources and skills to participate?	<p><i>Governance arrangements:</i> Resources made available such as time and money; communities of practice; learning</p> <p><i>Context:</i> Physical opportunities or restrictions; market conditions; support from NGOs</p> <p><i>Characteristics:</i></p>	<ul style="list-style-type: none"> • There are no technical limitations for farmers to participate in the initiative • There is a compensation for the cost • The measures fit to their farming style (e.g. dependent on animal pollination) • Farmers can implement area-specific measures 	<ul style="list-style-type: none"> • Farmers might not have enough time to implement measures properly • Farms do get compensated for the implementation of the measures, but it does not cover all cost • The measures might not fit completely with the farming style → perhaps farmers can choose the measure that fits best • Some complaints about bureaucracy 	<ul style="list-style-type: none"> • There are technical limitations for farmers • Farms do not get compensated for implementing measures • There is not enough time • The measures do not fit with the farming style • Farmers cannot implement area-specific measures

Condition	Operationalization	Influencing Factors	Criteria “High”	Criteria “Moderate”	Criteria “Low”
		Competences; knowledge; farming style; farm economy; finance			
Legitimization	Are farmers allowed to participate in wild pollinator protection initiatives?	<p><i>Governance arrangements:</i> Degrees of freedom within contracts with customers or in legislation; strictness of legislation and standards</p> <p><i>Context:</i> Prevailing social norms; room for changing legislation</p> <p><i>Characteristics:</i> Norms within the sector like group pressure; cultural setting; social control; innovativeness</p>	<ul style="list-style-type: none"> • Flexibility in the implementation of the measures • Involved parties ask for more bee friendly agriculture • Social pressure • Pressure by neighboring farmers 	<ul style="list-style-type: none"> • Stricter measures with some autonomy • Some cultural pressure to increase untouched nature in agricultural landscapes again • Neighboring farmers do not necessarily care what other do • 	<ul style="list-style-type: none"> • Very strict legislation • Complex rules and requirements • No cultural voices for change • Neighboring farmers are suspicious and sometimes afraid of the measures the other farmer does •

Table 10: Operationalization for criteria of Impact Assessment

Source: own creation based on Runhaar et al. (2017)

To assess which governance arrangements and which mode of governance is the most effective, seven interviews with farmers (four in England and three in Germany) were done. Based on the interviews with farmers, expert interviews and desk research, the scores of the initiatives were assessed and used to compare the initiatives. If an initiative was assessed as “high” in one condition, it was given 2 points. If it was assessed as “moderate,” it was given 1 point, and if it was assessed as “low,” it was given 0 points. A maximum of 12 points was possible to achieve. This scale allowed for an easy comparison of the initiatives but also of the different conditions. The scoring system can be seen in Table 11.

Condition	Fulfillment	Score
Scope	High	2
	Moderate-High	1.5
	Moderate	1
	Moderate-Low	0.5
	Low	0
Quality	High	2
	Moderate-High	1.5
	Moderate	1
	Moderate-Low	0.5
	Low	0
Motivation	High	2
	Moderate-High	1.5
	Moderate	1
	Moderate-Low	0.5
	Low	0
Demand	High	2
	Moderate-High	1.5
	Moderate	1
	Moderate-Low	0.5
	Low	0
Ability	High	2
	Moderate-High	1.5
	Moderate	1
	Moderate-Low	0.5
	Low	0
Legitimization	High	2
	Moderate-High	1.5
	Moderate	1
	Moderate-Low	0.5
	Low	0

Table 11: Scoring System Impact Assessment

Source: own creation

In the desk research, identified barriers and motivations in other European countries (see Table 12) were compared to statements the farmers and experts made. If inconsistencies were detected between the information gained in the desk research and the interviews, the interviewer assessed whether the inconsistency occurred based on an interpretation mistake (the video

recording was checked for specific parts) or if it might be a topic that has not yet been assessed in the literature.

Motivation:
<i>Economic Factors</i> e.g. financial support
<i>Personal Factors</i> e.g. need to do something for the environment
<i>Soft Factors</i> e.g. opinion of others
Barriers:
Space
Time
Sanctions
Bureaucracy
Lack of knowledge

Table 12: Motivation and barriers to implement measures identified in literature

Source: Herzon & Mikk, 2007; Defrancesco et al., 2008; Villanueva et al., 2015; Joormann & Schmidt, 2017.

The semi-structured interviews were held in English or German. A summary of the interviews with key messages and opinions can be found in the Appendix (Appendix G **Error! Reference source not found.** (Germany); Appendix H **Error! Reference source not found.** (England)).

3.2.3 Transfer of the Most Effective Mode of Governance and Initiative

To answer RQ3, the results from RQ2 were used in combination with the desk research (see Figure 5).

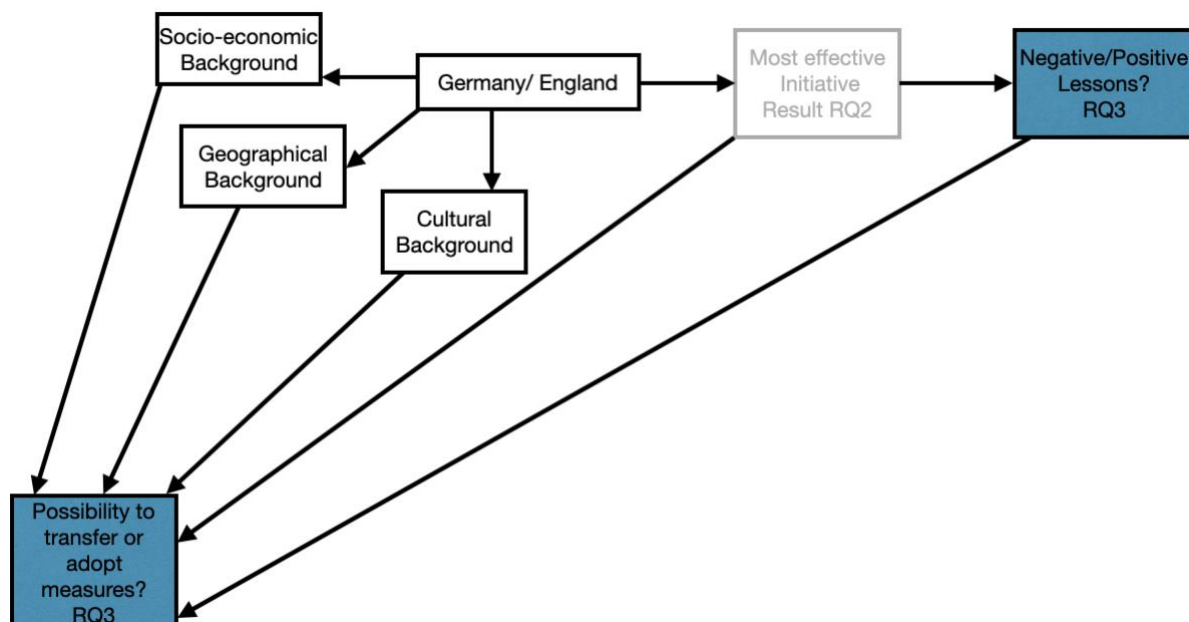


Figure 5: Steps to answer RQ 3

Source: Own creation

With the results from RQ2, three initiatives were assessed based on their perceived impact. Therefore, a conclusion on which initiative is most effective concerning the perceived impact of the governance arrangements and the motivation of farmers to participate could be assessed. Furthermore, lessons could be drawn from answering this research question based on what appeared to be the most effective mode of governance and initiative and thus by assessing what motivates farmers most to participate. Additionally, negative lessons could also be assessed. These include any criticism that farmers emphasized or initiatives that are not effective and thus are not worth transferring.

Furthermore, to decide whether the most effective initiative or the most effective mode of governance could be transferred from one political setting to the other, the results of RQ2 (i.e. the most effective initiative), the identified goals, and main actors of the initiative from RQ1 and desk research about the German and English cultural, geographical and socio-economic backgrounds has been done. Based on these results, on the most effective mode of governance and initiative in either country and on the governance arrangements' main goals, policy instruments and main actors, an assessment of whether a PT or adoption is possible and reasonable could be given.

4 Results

In the following section, the results pertaining to the prevailing modes of governance in wild pollinator protection are assessed. Moreover, the perceived effectiveness of the prevailing initiatives in Germany and England are analyzed in an indirect IA as well as the motivations and barriers of farmers to participate. Furthermore, differences in the prevailing mode of governance are analyzed to uncover their effects on effectiveness. Lastly, positive and negative lessons that can be learned from either country are described, and the possibility of a PT is discussed.

4.1 Germany

In Germany, approximately 46% of the land, roughly 23 million hectares, is used for farming purposes (BMEL, 2020). In 2019, approximately 1 million people were working in about 270.000 farms across Germany, producing goods of roughly 50 billion Euros annually and there has been an increase in bioenergy production. Currently, more than half of the agricultural land is used to grow crops to feed cattle. The most commonly grown plants are cereals, potatoes, sugar cane, oilseed rape, fruit, and vegetables (BMEL, n.d.). Additionally, in Germany, a downward trend from 2015 to 2019 has been seen in the number of farms. However, the quantities of the produced goods have increased. The main explanation for this is that there are larger and more efficient farms today, even though they are mostly still family-run (BMEL, 2020).

Most agricultural land is currently used to plant cereals (see Figure 6), especially wheat, but barley, rye, and oats are commonly cultivated. Only around 20% of the production is used for human consumption. 57% are used to feed animals such as cattle, pigs, and poultry. The rest of the land is used for horticulture; the Federal Ministry of Food and Agriculture (BMLE) differentiates between fruit, vegetables, and potatoes. As shown in Figure 6, grapes and hops are also commonly planted for alcohol manufacturing, as well as rapeseed and maize (corn) for biofuel production.

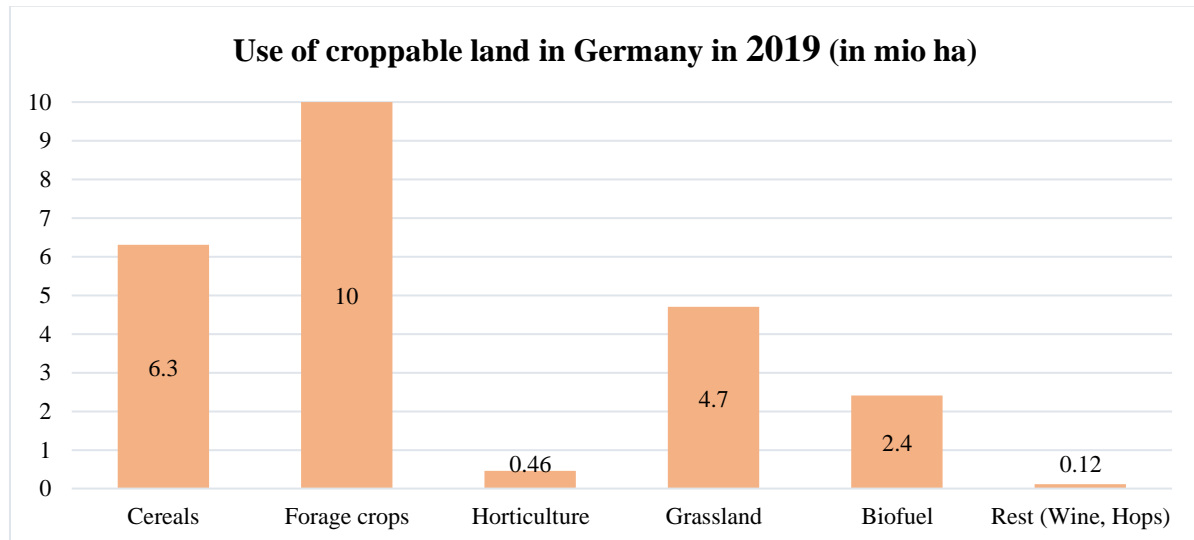


Figure 6: Use of croppable land in Germany in 2019 in mio ha
Source: Own creation based on BMEL, 2020

In Germany, a decline in insects has been confirmed. Currently, there is no pollinator monitoring scheme; however, it is in progress and there are approximately 561 wild bee species recorded. However, 41% are on the red list and close to extinction (BMU, 2019). Furthermore, Hallmann et al. (2017) published a groundbreaking study in Germany in which they have discovered an average decrease in insect biomass of 75% in the last 27 years in protected nature areas in Germany (see Figure 7), greater than the global average of 58% (BMU, 2019). In response, the German government decided that initiatives must be created to stop this decline and stabilize insect and pollinator diversity. Those initiatives should target especially agricultural landscapes since many problems such as the overuse of pesticides and insecticides, landscape fragmentation and therefore habitat loss for wild pollinators can be connected to agricultural intensification (Eardley et al., 2016; Kovács-Hostyánszki et al., 2017; Krimmer et al., 2019; Cole et al., 2020).

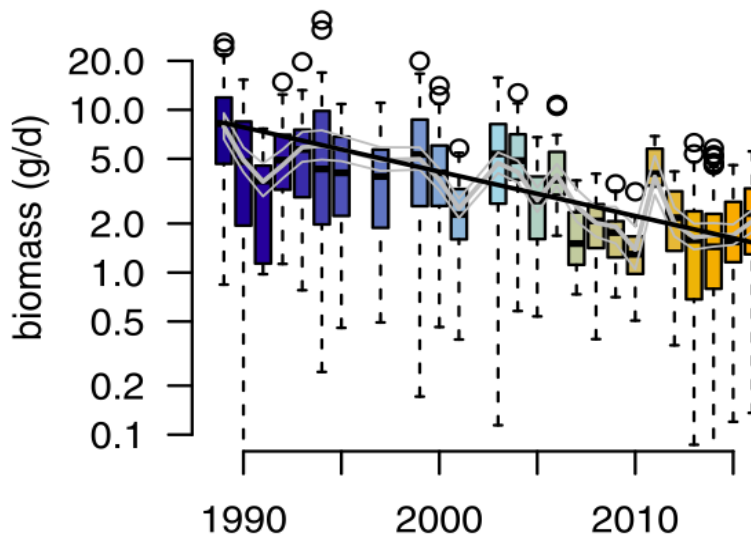


Figure 7: Insect decline in Germany
Source: Hallmann et al. (2017)

In Germany, the BMU (the federal ministry for Environment, Nature Conservation, and Nuclear Safety), BfN (the Federal Agency for Nature Conservation), and the BMEL (the Federal Ministry of Food and Agriculture) are the main actors in nature conservation. The BMU focuses on implementing and regulating governmental policies concerning the protection of the general public from environmental toxins and radiation. The ministry further focuses on establishing climate change action, the responsible use of raw materials, and on the conservation of biodiversity (BMU, 2019a). The BfN is the scientific authority by the government which focuses on nature conservation in Germany and globally. The BfN acts as a scientific consultant for the BMU to advise the government based on research and scientific evidence concerning nature conservation and landscape management. The BfN also coordinates multiple funding programs (BfN, n.d.). The BMEL focuses on all food and agricultural-related issues, such as animal welfare and food security.

Furthermore, the BMEL has multiple areas of focus that are connected with the protection of bees and insects (BMEL, n.d.a). The BMEL recognizes the decline in wild pollinators and determined that a main reason is land-use change and agricultural intensification. The BMEL developed the National Biodiversity Strategy to enhance biodiversity in general, with a focus on agricultural landscapes and the promotion of organic farming (BMEL, n.d.b).

4.1.1 Characterizing the Mode Governance in Germany

After the initial assessment (see Figure 3), twenty relevant initiatives were identified in Germany (Appendix I **Error! Reference source not found.**). Figure 8 shows the distribution

of the modes of governance of the identified initiatives. Interestingly, more than half of the initiatives are centrally governed i.e. public actors are the central actors in Germany concerning wild pollinator protection.

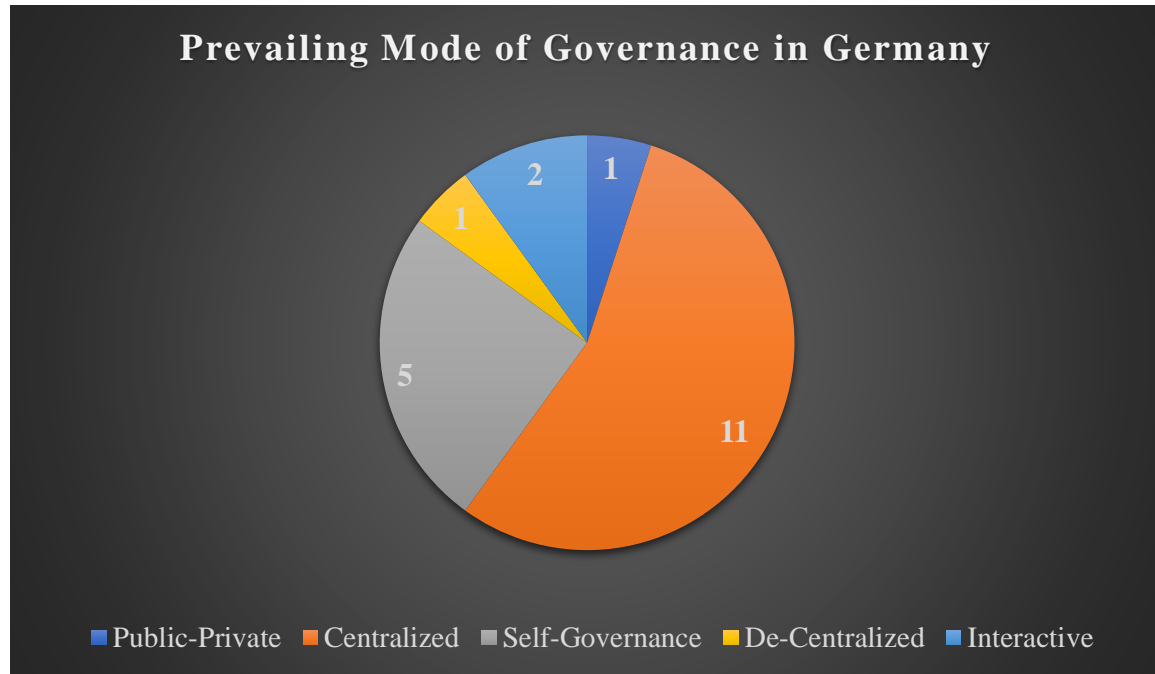


Figure 8: Modes of governance of identified initiatives in Germany
Source: Own creation

Generally, it is mandatory for farmers in Germany to cultivate different crops and to have permanent grassland areas. Furthermore, it is mandatory to leave 5% of arable land as ecologically-focus areas. This, for example, includes the use of nitrogen fixing crops, but it can also be an area which is not productive, such as flower strips or hedges (BMEL, n.d.a). Except for these mandatory measures, most other measures and initiatives are voluntary for farmers to implement, however they are often incentivized by the government. Expert 2 explained that this can be problematic. Firstly, most government-run initiatives are very complex and are connected to a burdensome bureaucracy that are difficult for farmers to navigate. Secondly, these initiatives often come with strict rules and potential sanctions. In his opinion, this often frightens farmers. Generally, Expert 2 considered voluntary measures to be ideal, however, he also emphasized that an underlying law is needed to push farmers in the right direction concerning the use of pesticides and the implementation of pollinator friendly measures.

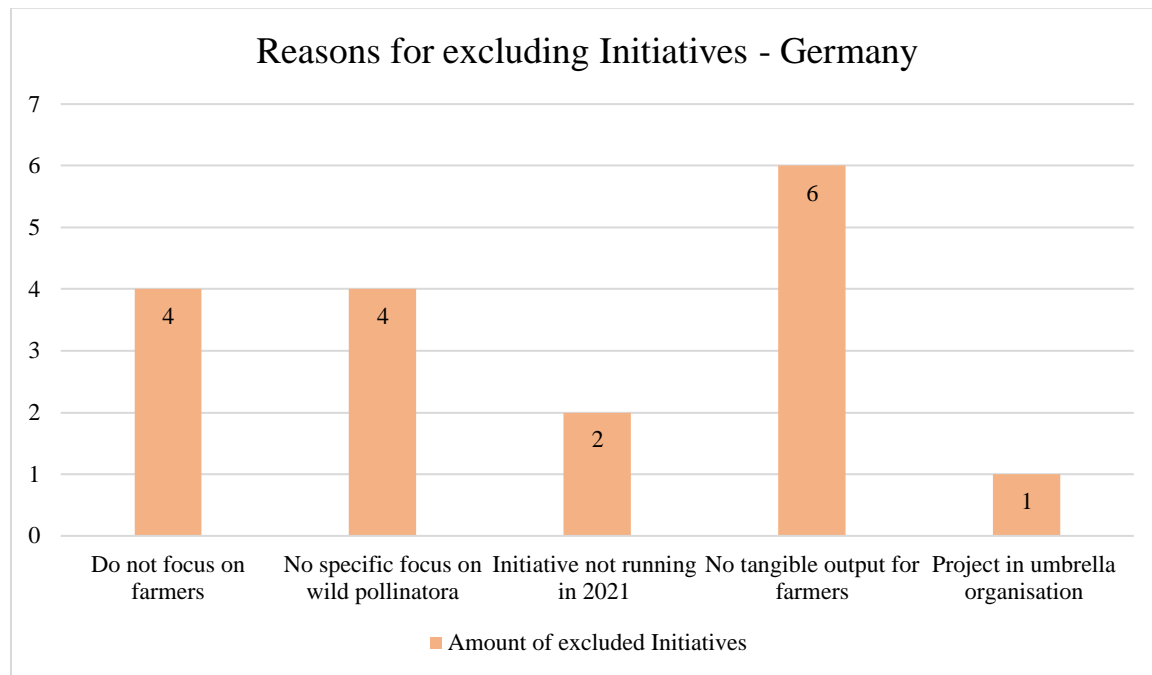


Figure 9: Reasons for excluding initiatives in Germany

Source: Own creation

Figure 9 shows that most initiatives in Germany were excluded because there was no tangible output such as monetary rewards, guidelines etc. Furthermore, many initiatives only addressed managed honeybees. There are multiple educational campaigns, websites and initiatives, however it appears that the education and knowledge exchange of threats to wild pollinators and their importance for humans and ecosystems is not widely communicated in Germany. After further applying the excluding indicators (see Table 4), four more initiatives were excluded because they only focused on the honeybee rather than “all pollinators.”

Additionally, it was found that governmental campaigns and initiatives often started by addressing managed bees but later on added the term “all pollinators” or “all insects”. A prime example relates to the use of pesticides. The National Action Plan for plant protection (NAP), which is based on research on the effects of pesticides and herbicides on plants and bees, initially only focused on honeybees. Only later on it was recognized as important to evaluate the risks for wild pollinators as well since they do not react the same way as honeybees do (NAP, 2021). Not only was the focus on wild pollinators often missing, initiatives focusing on agricultural landscapes often did not focus on the farmers and their benefits at all. Even though agricultural land-use is often named as one of the main causes of the pollinator decline (Holzschuh et al., 2008; Tirado, Simon & Johnston, 2013; Kovács-Hostyánszki et al., 2017; Cole et al., 2020), initiatives mainly focused on what individuals can do at home i.e. greening their balconies with proper plants.

Furthermore, if initiatives focused on farmed land, often the benefit for farmers was neglected. Expert 1 explained, that some farms and some crops such as rape are self-pollinated and thus do not depend on pollinators. Forcing those farmers to implement pollinator friendly measures does not appear to make sense, especially without a benefit. In the interviews, the opinion to implement measures at a farm for nature's sake only was not mentioned. The main reasons to implement measures and to participate in initiatives were the negative opinion of civil society or to satisfy the wishes of family members. One farmer, however, mentioned that he wants to protect birds on the red list in his area and thus became interested in insect protection as food source for the birds. Additionally, all farmers mentioned that they are farming as their main occupation and thus need compensation if they leave some part of their fields uncropped. Furthermore, Expert 2 mentioned, that solutions like flower strips should be analyzed more and cannot be seen as the one golden solution. According to him, a proper understanding of how they work has thus far not been established. Accordingly, differing expectations may result in misleading recommendations. For example, efforts towards a “universal” flower mixture composition contradicts the dependency of local pollinator community structures on landscape context. Instead, spatially explicit solutions are required, which currently challenges legal regulations, but open opportunities for pollinator conservation activities initiated by non-government actors, which appear to be lacking at the moment. This was also backed up by Expert 1 who explained that a systemic approach is needed in Germany and that a connection between similar landscapes should be aimed for by initiatives.

All German experts concluded that there is not one solution or one perfect initiative that can increase the amount and diversity of pollinators across all of Germany's landscapes and regional contexts. However, especially Expert 3, emphasized that NGO-lead initiatives are very important, but that legislation has to play a role to achieve and create long-term solutions.

In this analysis, after using all excluding indicators (see Table 4) three relevant initiatives were established which have been further assessed (Table 13).

	Action Program for Insect Conservation	Competition of Insect Friendly Farming	#Beebetter
Explanation	Comprehensive plan for Germany to protect insects and increase their diversity; nine areas of action → agricultural land is one of them	Annual Competition as part of the Action Program to reward farmers with measures in place	Platform to gather information and interact with different actors → Additional creation of a competition

Mode of Governance	<i>Centralized</i>	<i>Centralized</i>	<i>Interactive</i>
Main Actors	Federal Ministry for the Environment (BfN), Nature Conservation and Nuclear Safety (BMU)	Ministry of Food and Agriculture (BMEL)	BurdaHome, WWF, Federal Ministry of Food and Agriculture, famous people
Main Goals	<ul style="list-style-type: none"> • Increase habitat for insects • Connect habitats • Promote insect protection by the creation of binding requirements and clear guidelines for the use of pesticides etc. 	<ul style="list-style-type: none"> • Honor farmers' engagement • Motivate and inspire other farmers to implement wild pollinator protection measures – show that pollinators can have an advantage for farmers if the amount and diversity increases • Decrease impact that agriculture has on pollinators by showing innovative ideas, increase habitats and decrease threats for wild pollinators 	<ul style="list-style-type: none"> • Enhance knowledge exchange and collaborative working between stakeholder by putting information online and hosting events • Increase motivation of farmers to participate in pollinator protection • Stimulate innovation regarding the protection of wild pollinators throughout different landscapes but also especially in agriculture
Policy Instruments	<ul style="list-style-type: none"> • Create binding requirements to increase wild pollinator habitat • Regular reports (initiative to check if they achieved goals & farmers to see if they comply with the rules) • Field visits to check compliance • fines if rules are broken 	<ul style="list-style-type: none"> • Price money • Short movie for winner to use for marketing purposes and raise awareness 	<ul style="list-style-type: none"> • Newsletter • Public events • Quiz and games

Table 13: Relevant initiatives in Germany
Source: Own creation

4.1.1.1 The Action Program for Insect Conservation

Germany, compared to England, does not have a specific national pollinator strategy. The main plan to protect pollinators and increase their diversity is part of the Action Program for Insect Conservation.

The Action Program for Insect Conservation was created and implemented in September 2019. This program focuses on nine areas of action which significantly impact insects based on scientific research (Promote Pollinators, n.d.). The Action Program starts with a detailed analysis of why insects are needed and how to achieve a stable community in Germany. Thus, the federal government aims to reverse the negative trend of insect abundance and diversity. They base their argumentation on the nationwide Red List and scientific studies in Germany and other EU countries (BMU, 2019b). With the Action Program, the government plans to create mandatory and voluntary measures to tackle landscape fragmentation and agricultural intensification (BMU, 2019b).

The main actor in this governance arrangement is the BMU, which initiated the project. Thus, it is centrally governed. This program aims to create binding requirements for all stakeholders under the Insect Protection Act (see Appendix I **Error! Reference source not found.** for more details). They furthermore desire to create rules for nature conservation law and create legislation, especially in agricultural land, for fertilizers and wastewater (Promote Pollinators, n.d.). Additionally, the government plans to invest 100 million Euros per year in insect protection initiatives to promote insect protection and increase research funds. They aim to create clear guidelines on how, who, which, and when to use pesticides (Promote Pollinators, n.d.). For agricultural landscapes, the Action Program aims to achieve six goals. Those goals all strive to be fulfilled at different times between 2020 and 2030. The main objectives are for the federal government to cooperate with regional states and to put the needs of insects in the German strategic plan for the CAP post-2020 with an emphasis on establishing and maintaining diverse habitats and creating pathways for insects in agricultural land (BMU, 2019b). This includes an insect-friendly mowing strategy, crop rotations, the delivery of mixed flower seeds, and the creation of flower strips.

Secondly, an increase of transition or boundary habitats (ecotones) are sought to be established (BMU, 2019b). Those areas can naturally or artificially be found in transition areas between different ecosystems, landscapes, or habitats. Usually, in the semi-natural environment, these boundaries cannot be delineated. Human-made boundaries can be, for example, through field margins (Dennis, Fry, & Andersen, 2000). Boundary habitats mainly offer a significant number of ecological niches. Thus, as the BMU 2019b report mentioned, these areas tend to have a high amount and diversity of insects and need to be expanded and protected.

Thirdly, the federal government aims to develop an arable farming strategy that is backed by funding. This strategy will specifically focus on increasing biodiversity in agricultural landscapes (BMU, 2019b).

Lastly, the Action Program aims to invest in further research to assess threats to pollinators in agricultural landscapes. Moreover digital technologies should be used more frequently in agriculture with a focus on conserving biodiversity and insects to, for example, make the mapping of pollinator measures on fields easier for farmers by measuring them with satellite pictures (BMU, 2019b).

As policy instruments, the central governed initiatives mainly uses reporting activities. They publish regular updates on the implementation to allow checks on the implementation progress of measures, to check whether the set objectives are achievable, and recognize early on if any adjustments are necessary. Furthermore, the government will assess whether those measures have been successful and if the set goals can be achieved. This will be done with indicators and a progress report. These will be published on a biannual basis by the Federal Environment Ministry. Additionally, farmers will have field visits and receive fines if they do not comply with the rules. Farmers also will have to report annually about the scale of their measures and the type of measure implemented in their farms (BMU, 2019b).

4.1.1.2 Competition of Insect Friendly Farming

The Competition of Insect Friendly Farming was first held in 2020 by the BMEL. This initiative arose through a proposal of the Action Program for Insect Conservation by the BME, which aimed to create an annual competition. The BMEL recognizes that farmers have a high responsibility for producing foods for stabilizing biodiversity. With this competition, they seek to honor and reward farmers' engagement, motivate others to implement those measures, and show that the protection of insects can be an advantage as well. The BMEL will honor those projects and ideas that are, in their opinion, long-term and future-oriented solutions, which should also open up a dialogue between researchers and farmers, which currently is not enough. Projects should aim to increase and stabilize the amount and diversity of insects with a particular focus on pollinators in agricultural landscapes (BMEL, 2020a). This initiative, coordinated by the BMEL, is also centrally governed.

The BMEL rewards farmers in two different categories. The first category is for individual farmers who implement insect-friendly measures in their fields. The second category

is for cooperation's, for example, farmers clusters or farmers cooperating with civil society or other actors such as beekeeper associations. In every category, the BMEL names three projects which are the most inspiring, influential, and future-oriented. The first place will receive 5.000€; the second place will receive 3.500€, and the third place will receive 2.500€. Price money in this initiative is used as one of the main policy instruments.

Furthermore, the winning projects are filmed, and professional short movies are presented to the winners, which can be used for marketing purposes. Moreover, the winners receive a certification that states that they are an insect-friendly farm or association (BMEL, 2020b). Judges of this competition are selected from the BMEL and are independent industry representatives of agricultural associations, nature protection agencies, and researchers (BMEL, 2020a).

4.1.1.3 #Beebetter

#Beebetter was created as a platform to gather information, to engage with others, and to share new ideas, with participants ranging from individuals to groups, farmers, schools, companies, cities, etc. (beebetter, n.d.). Information on the platform is available about both honeybees and wild pollinators. Furthermore, the website publishes information about pollination, the decline of pollinators, and tips on what people (farmers, individuals, etc.) can do in their own home, garden or field.

#Beebetter is interactively governed. The main actors and associators are BurdaHome, in cooperation with the World Wildlife Fund, and the company Neudorff (beebetter, n.d.). The idea behind the initiative is that small individual projects will lead to progress and eventually increase the diversity and number of pollinators around Germany (Neudorff, n.d.). Furthermore, it uses famous people in Germany, such as Uschi Glas, Nina Rufe, or Steven Götjen, to advertise the initiative on social media to especially also reach the attention of the younger generation. The organization was created under Julia Klöckner, the Federal Minister of Food, Agriculture and Consumer Protection.

The overarching goal is to enhance the knowledge exchange of stakeholders and build a conversation around the declining trend of pollinators. Furthermore, #beebetter aims to bring parties together to work on different solutions throughout Germany to create insect pathways of similar landscapes (beebetter, n.d.). Moreover, the organization has created the #beebetter award. This award is given in five different categories. Farmers in the farming category can win €10.000 for their projects, with the understanding that this prize money will be reinvested in pollinator protection initiatives (beebetter, n.d.a). The competition's goal is to make existing

projects more widely known in Germany and ideally to inspire others to do the same or to invest in new ideas.

The judges of this competition are a mixture of experts, including experts of wild pollinator and honeybees, and representatives of the agricultural association, research and landscape management. Furthermore, representatives of the #beebetter partners and sponsors so as the journalist of Hubert Burda Media (beebetter, n.d.b) are included in the decision process of who is winning. The whole initiative focuses on stimulating innovation and emphasizes knowledge exchange.

4.1.2 Assessing the Perceived Effectiveness of Pollinator Governance Arrangements in Germany

In the IA, firstly, the quality and scope of the three identified initiatives were assessed with desk research about the initiative and with interviews with experts and farmers. Furthermore, the four proposed conditions by Runhaar et al. (2017), *motivation, demand, ability* and *legitimacy* were also assessed based on desk research and interviews. In total, a score of 12 was the highest an initiative could achieve (see Table 11). With this score, the perceived effectiveness of the initiatives was assessed, and they could be compared. Additionally, it was useful to assess if the motivation of farmers to participate differed depending on the mode and if the scopes of the initiatives were different depending on their mode of governance. For the IA in Germany, interviews were held with three experts and three farmers.

In the following parts, first an assessment of the effectiveness and the peculiarities of the identified initiatives are given, including the opinions of the interviewed farmers and experts on the three identified initiatives: Action Program for Insect Conservation, Competition of Insect Friendly Farmers and #beebetter. After this, a general conclusion of the IA in Germany is given. In this conclusion, the differences and similarities between the initiatives are highlighted, and an analysis is given as to whether the mode of governance played a role in the effectiveness and as to whether any of the four conditions have substantially influenced the score.

4.1.2.1 Action Program for Insect Conservation

In the IA, the Action Program for Insect Conservation achieved a score of 5.5 out of 12 possible points (a detailed assessment can be found in Appendix A **Error! Reference source not found.** of all the initiatives). The distribution of the scores can be seen in Table 14.

Condition	Fullfillment	Score
Scope	High	
	Moderate-High	
	Moderate	1
	Moderate-Low	
Quality	Low	
	High	
	Moderate-High	
	Moderate	1
Motivation	Moderate-Low	
	Low	
	High	
	Moderate-High	
Demand	Moderate	0.5
	Moderate-Low	
	Low	
	High	
Ability	Moderate-High	1.5
	Moderate	
	Moderate-Low	
	Low	
Legitimization	High	0.5
	Moderate-High	
	Moderate	
	Moderate-Low	
Overall Score	Low	1
	Moderate	
	Moderate-High	
	High	
Overall Score		5.5

Table 14: Score distribution Action Program for Insect Conservation
Source: Own creation

The centrally governed initiative has a moderate *scope* (i.e., it targets all farmers in Germany; an explanation of the scores can be found in Table 8); however, it does not distinguish between different farming types and styles (e.g., dairy farmers and cereal farmers), and it also does not differentiate between different landscape contexts. Additionally, it works with a mix of mandatory and voluntary measures. From the latter, the farmers can choose the one that suits them the most (BMU, 2019a).

The *quality* of the initiative was also considered to be moderate. The initiative shows clear objectives and ambitious auditing and reporting plans to fulfill the objectives. However, the focus on insects and not just pollinators might be too generic (Expert 1; all interview summaries can be found in the Appendix C **Error! Reference source not found.**). Furthermore, the compensation for farmers is minimal and only available if strict rules are

followed (Farmer 1). The overall *motivation* of farmers to participate in this governance arrangement is only moderate-low.

The motivation of farmers to participate in this initiative is moderate-low because farmers consider it essential to receive some reward for implementing measures, ideally a financial reward, benefit or compensation (Farmers 1, 2, 3). Additionally, it appeared to be important that measures are voluntary to implement for farmers (Farmers 1, 2, 3). However, experts state that in their experience, voluntary measures do not lead to the desired uptake and thus cannot be considered effective for the diversification and increase in pollinators (Experts 1, 2). Nonetheless, farmers might feel suppressed if they are forced to implement measures and have no say in which measures to implement, especially if they do not benefit from them (Farmers 1, 3). However, motivation to participate in initiatives appeared to increase if direct effects could be seen, for example, on the number of pollinators in their fields, especially with flower strips, bee hotels and dirt hills (Farmers 1, 2). However, none of the farmers have thus far experienced an increase in crop production. Furthermore, some changes need time and cannot be observed immediately, which should be communicated to farmers transparently so that they do not lose motivation too quickly (Expert 1).

In the *demand* condition, the governance arrangement received a score of 1.5. Thus, it is moderate-high. Farmers are partly obligated to participate under the CAP. However, some measures are voluntary and adjustable on a trim level (BMU, 2019a). The requirements for farmers, however, are stringent (Farmers 1, 2, 3). Societal pressure to participate in a wildlife protection initiative is also perceived as very strong (Farmers 1, 2, 3).

Additionally, it is perceived that some of the rules of the action program should be made stricter but that farmers should be able to choose between the measures they want to implement (Farmer 1). However, controversially, the farmer that stated this added that the rules in the implementation of measures are too harsh. If a field margin is 100m², the farmer will get money for it, and if it is 98m², they will not, which does not reflect the actual benefits. Furthermore, some farmers do not apply for the funds because it is too complex, too complicated, or too harsh. Instead, Farmer 1 mentioned that some farmers create a flower margin in areas that are not very fertile and are happy if neighbors or family consider it “pretty.”

The *ability* of farmers to participate was moderate-low, and thus the action program for insect conservation only received 0.5 points. The main issue regarding participation was the significant bureaucracy involved and, therefore, the time that farmers need to invest (Farmers

1, 3). Since all interviewed farmers are working full-time on their farms, the more time they spend in the office working on fulfilling criteria of this initiative, the less time they have on their fields, and thus this often translates into a decrease in yield and hence money. Therefore, it is not appealing for farmers to participate in this initiative (Farmers 1, 2, 3). Additionally, more advanced reporting knowledge of farmers is needed to join because detailed reporting is necessary. Furthermore, computer mapping skills are essential, which the farmers do not always have, especially the older farmers, making it harder for them to participate (Expert 2; Farmers 1, 2).

Lastly, the *legitimization* of this initiative was considered moderate, and thus a score of 1 was given. The initiative involves implementing mandatory measures, which are strictly controlled (BMU, 2019a). However, farmers have some autonomy in implementing the measures on their farms (Farmer 1). They did not experience any cultural pressures to participate. However, neighboring farmers and civil society significantly influence farmer behavior (Farmers 1, 2; Expert 2).

Additionally, the initiative provides information on the main areas of impact for insects and thus has an excellent problem statement; however, the strategies for tackling the problems are not explicit (Expert 3). Furthermore, it appeared problematic that the suggested measures do not consider that landscapes can be very different across Germany, so more local initiatives and solutions should be regarded (Experts 1, 2). This is also backed up by Mupepele et al. (2019), who state that for the action program to become a central instrument to reverse the negative insect decline, the adaptability to local conditions needs to improve.

Furthermore, the Action Program also seems to receive criticism from farmers and industry. Harsher rules for pesticides in particular appear to have conflict potential. Counterparts argue that the decrease in pesticides could lead to a reduction in crop production and does not necessarily help pollinators; therefore, in the end, no one would profit from this rule (Evers & Stephan, 2021; Expert 1).

4.1.2.2 Competition of Insect Friendly Farmers

In the IA, the Competition of Insect Friendly Farmers received 6 points out of 12. This score is similar to the other centrally governed initiative in Germany (the Action Program for

Insect Conservation). However, the distribution of the scores are different, especially in regard to demand and scope (for the distribution of scores, see Table 15).

Condition	Fullfillment	Score
Scope	High	2
	Moderate-High	
	Moderate	
	Moderate-Low	
Quality	Low	
	High	
	Moderate-High	
	Moderate	1
Motivation	Moderate-Low	
	Low	
	High	
	Moderate-High	
Demand	Moderate	
	Moderate-Low	
	Low	0
	High	
Ability	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	0
Legitimization	High	
	Moderate-High	1.5
	Moderate	
	Moderate-Low	
Overall Score	6	

Table 15: Score distribution Competition of Insect Friendly Farming
Source: Own creation

This governance arrangement received a score of 2 for the *scope*, which was considered to be high. This assessment was made because the initiative targets individual farmers with measures in place and farmer collaborations, which are considered essential to achieve a more significant effect for pollinators (BMEL, 2020a; Expert 2). Thus, this initiative also addresses differences in landscape contexts and is accessible for all farmers in Germany (Experts 1, 2).

The *quality* of this initiative was considered to be moderate. The compensation (i.e., the prize money for the winner and the two other best projects) is very reasonable. Additionally, a short movie of the farming practices and the pollinator protection measures will be created for the winner that can be used for marketing purposes. However, there is controversy about whether farmers need this. Some think that they can create an appealing website themselves (Farmer 3), and others often also use social media and believe a professional short movie could

be helpful (Farmers 1, 2). Furthermore, the Competition of Insect Friendly Farmers initiative does not have specific information on how their initiative will benefit wild pollinators, and there are no guidelines in place, which makes it difficult to assess whether it is a success or not (BMEL, 2020; Experts 1, 2).

Furthermore, the *motivation* of farmers to participate in this initiative is low, and it thus received 0 points mainly because farmers do not feel like they would get a benefit from their participation (Farmers 1, 2). They, however, appreciate the initiative because it gives them room to implement suitable measures without much bureaucracy and without many rules to follow. Additionally, farmers liked the idea of knowledge exchange between farmers to see what works for them, how much each farmer had to invest and if they profit from the measures put in place (Expert 1). This initiative might also open up a dialogue between farmers, the government and society, which appears to be essential to benefit farmers and pollinators (Experts 2, 3). Even though the initiatives are considered interesting in terms of opening up dialogues between different stakeholders, farmers are not motivated because they do not have enough time to read about suitable measures and putting them in place to participate in a competition (Farmers 1, 2, 3).

Additionally, a competition was not considered a good tool to increasing knowledge exchange and innovation because farmers should ideally be urged to work together (Farmer 2; Expert 2). Furthermore, most measures proposed by the government are directly considered negative. Farmers feel that civil society and the government assume that the loss of biodiversity is their fault, and they feel that they are the only ones who have to change and work to counteract this decline. Additionally, governmental incentivized initiatives are understood as the government pushing away their responsibility and placing it instead on individuals (Farmers 1, 2; Expert 2). However, this centrally governed initiative does not appear to be too complex. It does not have many rules, guidelines or penalties, but it focuses on increasing and strengthening farmers' creativity and sense of innovation (BMEL, 2020a). However, if a negative perception hinders farmers from participating in this initiative, it cannot be considered effective.

The *demand* for this initiative is also considered low because the participation is voluntary, there are no specific measures that have to be taken and no guidelines, and the applying process does not appear to be complicated (BMEL, 2020a; Expert 2). The main reason for potential participation is the increasing pressure of civil society for farmers to use more nature and biodiversity-friendly farming methods (Farmers 1, 2, 3).

The *ability* of farmers to participate was considered moderate-high because all farmers can theoretically participate; however, they do not have much time, and since only three farmers get compensation, or a reward, farmers would spend money and time on something that has no financial benefit (Farmers 1, 2, 3). In terms of bureaucracy, there have been no complaints about too much paperwork.

The *legitimization* of this initiative was considered moderate-high because farmers can implement their measures based on their own farming style and landscape contexts (BMEL, 2020a). Since there is societal pressure to implement more measures, this competition is perceived as interesting and effective by civil society to counteract the negative impacts traditional farming without any measures in place has on wild pollinators (Farmers 1, 2; Expert 2).

Since there has only been one contest so far, which took place in 2020, long-term negative aspects could not yet be identified in the literature. Newspaper articles have been relatively neutral.

4.1.2.3 #Beebetter

#Beebetter achieved a score of 5 in the IA, which is the lowest score for the German initiatives. However, the three initiatives all scored within a range of 1 point difference of each other (for the score distribution, see Table 16).

Condition	Fullfillment	Score
Scope	High	2
	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	
Quality	High	
	Moderate-High	
	Moderate	1
	Moderate-Low	
	Low	
Motivation	High	
	Moderate-High	
	Moderate	1
	Moderate-Low	
	Low	
Demand	High	
	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	0
Ability	High	
	Moderate-High	
	Moderate	1

	Moderate-Low	
	Low	
Legitimization	High	
	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	0
Overall Score	5	

Table 16: Score distribution #Beebetter

Source: Own creation

The *scope* of this initiative was considered high, and it received 2 points. #Beebetter targets all farmers in Germany, including individuals or groups (beebetter, n.d.a). Thus, they take landscape and farming context into consideration, and collaboration of farmers is always considered positive and more impactful for pollinators because landscapes can be connected. Therefore pollinator habitat can increase (Experts 1, 2).

The *quality* of this initiative was considered to be moderate, and thus 1 point was given. The initiative focuses on creating a knowledge exchange between stakeholders; however, there are no plans or strict goals that are being followed or that are measurable. Additionally, compensation is only available for the winner of the competition. However, an independent jury (beebetter, n.d.-a) assesses the benefit for pollinators, but it is not specified if they are more concerned with especially threatened pollinators.

The *motivation* of farmers to participate in this initiative was considered to be moderate. #Beebetter was perceived more positively by farmers (Farmers 1, 2) mainly because it focuses on smaller projects and projects that do not necessarily have to be the most innovative ones (Experts 1, 3; Farmers 1, 2). However, time was considered an issue here and the perception that they do not get a benefit out of participating in this initiative (Farmers 1, 2, 3). Additionally, it was considered positive that the initiative is not solely incentivized by the government (Farmers 1, 2, 3).

The *demand* for this governance arrangement was considered to be low. Thus, 0 points were given. This governance arrangement is voluntary and focuses on knowledge exchange and the stimulation of innovation. It increases farmers' motivation to participate with less effort; however, there is no benefit for farmers, and the initiative is not very well-known (Farmers 1, 2, 3; Experts 1, 2, 3). The requirements to participate are not strict, but except for creating knowledge and possibly winning prize money, the farmers do not get much out the participation, especially if they do not win (Experts 1, 2; Farmer 2).

The *ability* of farmers to participate was considered to be moderate. There are no bureaucracy issues and not much paperwork needed. However, time is crucial for farmers. Thus, if they have to invest more to benefit from this initiative, it is not considered worth it, and therefore the benefit of this initiative is considered too low (Farmers 1, 2, 3).

Regarding *legitimization*, the initiative was considered low, and thus it received 0 points. The initiatives appears to be interesting for farmers since it is not very complex and completely voluntary (Farmers 1, 2, 3), but this decreases its legitimacy (Expert 2). There are no rules or guidelines that have to be followed. The winner is established through a jury based on criteria that are not clear (beebetter, n.d.a).

Thus, it appears that even though the #beebetter award is similar to the award from the Competition of Insect Friendly Farmers, it is perceived as a better award mainly because it is not only incentivized by the government.

4.1.2.4 Overall Assessment Germany

In Germany, only a minor difference in the score (i.e., the perceived effectiveness, including the conditions and the scope and quality of the initiative, of the governance arrangements) has been detected (see Figure 10) within a range of 1 point difference.

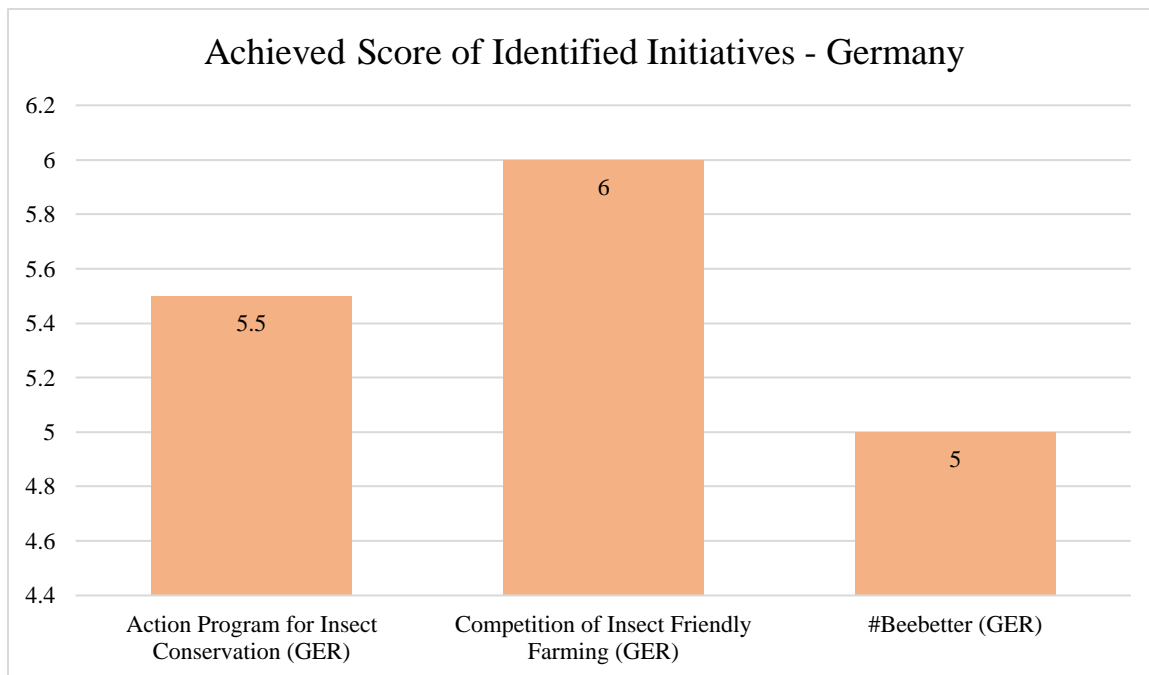


Figure 10: Achieved score of identified initiatives in Germany (GER)

Source: Own creation

In this assessment, the centrally governed initiative Competition for Insect Friendly Farming was considered the most effective. Looking at the mode of governance, one can see that the centrally governed initiatives received a higher overall score than the interactively governed one, and thus it is considered that centrally governed initiatives are most effective in Germany (see Figure 11).

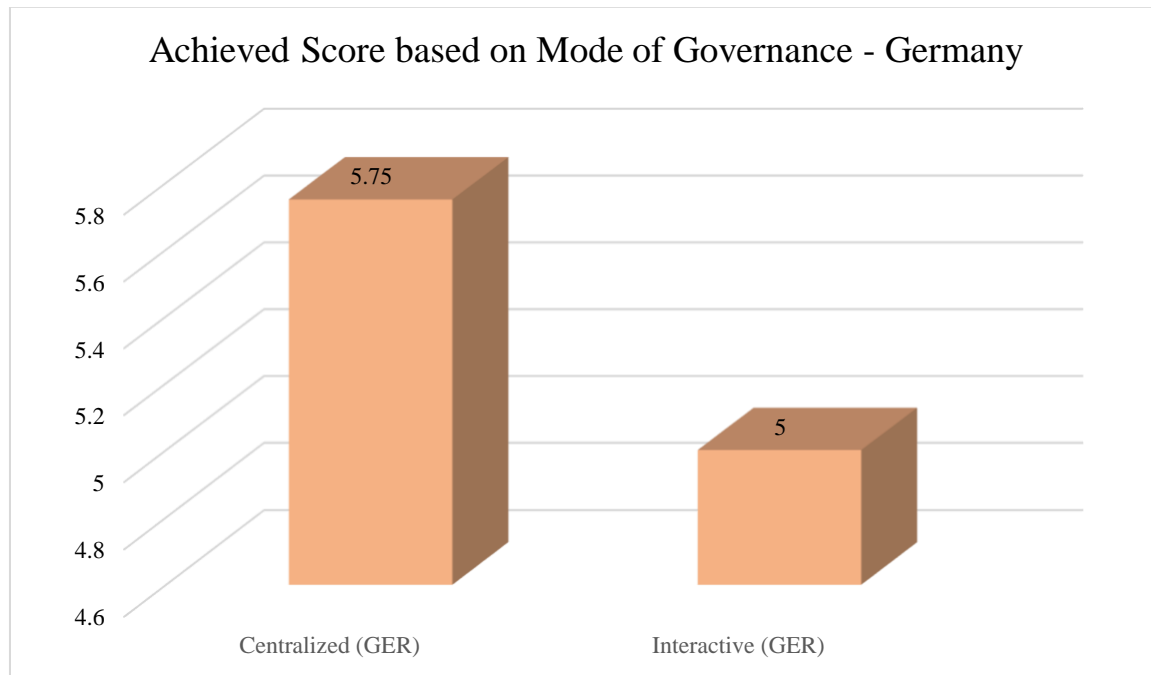


Figure 11: Achieved score, based on the mode of governance in Germany (GER)

Source: Own creation

However, if comparing the scores of the different conditions individually, it is fascinating that the interactively governed initiative #beebetter scored the highest in the motivation for farmers (see Figure 10) and that it also scored high in regards to the scope (see Figure 12) even though it was considered the least effective in the overall score.

Governmental initiatives do not seem to incorporate farming clusters much. Furthermore, they do not appear to differentiate between different farming styles and landscape contexts. Thus, the scope is smaller than for the interactively governed initiative (Experts 1, 2).

Additionally, German farmers specifically mentioned that farming had been an object of changing legislation for years now. They do not feel heard, understood, and talked down to by the government. Thus, farmers mentioned that they do not have a good relationship with the government and that the first impression is always a bit lower than for other initiatives (Farmers 1, 2, 3). They also mentioned that they know that agricultural landscapes and practices might threaten pollinators and that something has to change. Still, they want their needs to be heard

and incorporated and want civil society to stop understanding them in negative terms (Farmers 1, 2).

Furthermore, intrinsic motivation currently in Germany appears to be essential for participation, such as the desire to counteract negative opinions of civil society, to make family members happy, to have diverse wildlife for future generations and to show neighboring farmers that a more sustainable way of farming might be to some extent possible to combine traditional farming (Farmers 1, 2, 3).

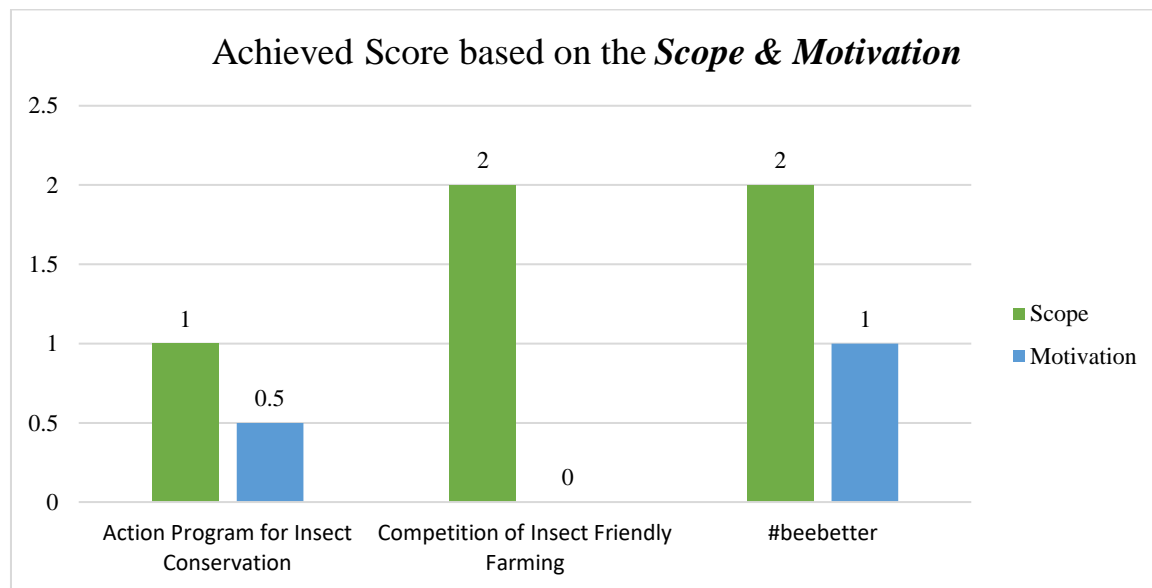


Figure 12: IA - Score based on scope and motivation
Source: Own creation

Generally, the main barrier for farmers to implement pollinator measures were time, too much bureaucracy, no benefit and financial issues. These are similar issues to the ones identified in research on the implementation of measures for biodiversity in other countries. However, lack of knowledge was not mentioned in the interviews with the farmers or with the experts.

4.1.3 Lessons Drawn from Germany

The German case showed that in the overall assessment including all conditions, scope and quality, centrally governed governance arrangements appear to be effective concerning the perceived impact. Especially positive is the high legitimization of those initiatives. Centrally governed initiatives usually have a clear outline of measures to implement, of how to implement

them and of how success is measured. Thus, this is comfortable for farmers because they do not have to do much of their own research, which saves valuable time (Farmers 1, 3; Expert 2).

However, the uptake of farmers and their motivation to participate are low, especially when participation is voluntary. Farmers and experts agreed that a regulatory framework is needed to push farmers into achieving the same goal. This is also helpful because not all farmers have intrinsic motivation to participate on their own in such initiatives (Expert 1). It appears to be essential that as many farmers as possible start to use some measures to connect natural habitats. Within this framework, however, voices by experts and farmers themselves are loud to give farmers the option of adjusting measures and picking relevant ones. If this were implemented, farmers would be able to focus on adopting measures to their specific farm characteristics, such as size, farming style, soil type and type of farms, and threatened pollinators in the area could be better addressed. Additionally, minimum requirements, harsh fines and penalties also decrease farmers' motivation to participate in any initiative. They also decrease the demand and thus the overall effectiveness.

Moreover, farmers are suspicious of the government, primarily due to the ever-changing regulations concerning pesticides and mandatory requirements, fines and penalties that are feared and due to there being little or no (monetary) benefit for farmers. Therefore, a mainly centralized approach, especially for voluntary measures, does not appear to be effective. A lesson learned here is that farmers' voices need to be heard, and they should be included in the creation of initiatives. Decisions should not only be made top-down. Including farmers in the creation of initiatives would not only increase farmers' motivation to participate, but it might also increase the initiatives' scope by including all farming styles.

Additionally, in Germany, there is not only one ministry that is focused on the insect/pollinator decline; instead, it is part of the plans of many ministries. This, however, makes it difficult to gather the desired data promptly. Furthermore, it makes it difficult for farmers to understand which ministry to contact for questions, and it creates a time-consuming process to acquire the desired answer.

None of the initiatives in Germany consider which pollinators are in decline in which area. However, this seems to be an essential point to understand to make the measures more adaptable. For example, flower strips should not only be created with a standard seed mix. It should be possible to check which pollinators are threatened in the farmers' area and adapt the

seed mix since most threatened pollinators are usually plant-specific (i.e., they need the specific nectar of a particular flower/plant).

Thus, the lessons learned in Germany are that a centrally governed approach appears to be effective however when the motivation of farmers to participate in, especially, voluntary centrally governed initiatives is low, the uptake will be low and thus the initiatives cannot be considered effective. Hence, farmers' goals, needs and benefits should be included in the creation of initiatives. However, they should be framed by mandatory measures with voluntary ones to adapt to individual farming styles and landscape contexts.

4.2 England

In 2020, England's utilized agricultural area (this includes arable and horticultural crops, uncropped arable land, temporary and permanent grassland, grassland used for outdoor pigs and common rough grazing) was estimated to be approximately 8.9 million hectares. Of the utilized agricultural area, 54%, which is approximately 4.8 million hectares, is the total croppable area; 41% is permanent grassland; and 6% is owned land (Defra, 2020). Currently, 302,000 people are employed in agricultural holdings. The majority of crops planted in England are cereals and oilseed crops. Figure 13 shows the distribution of cultivated crops in the croppable area in England in 2020 (Defra, 2020).

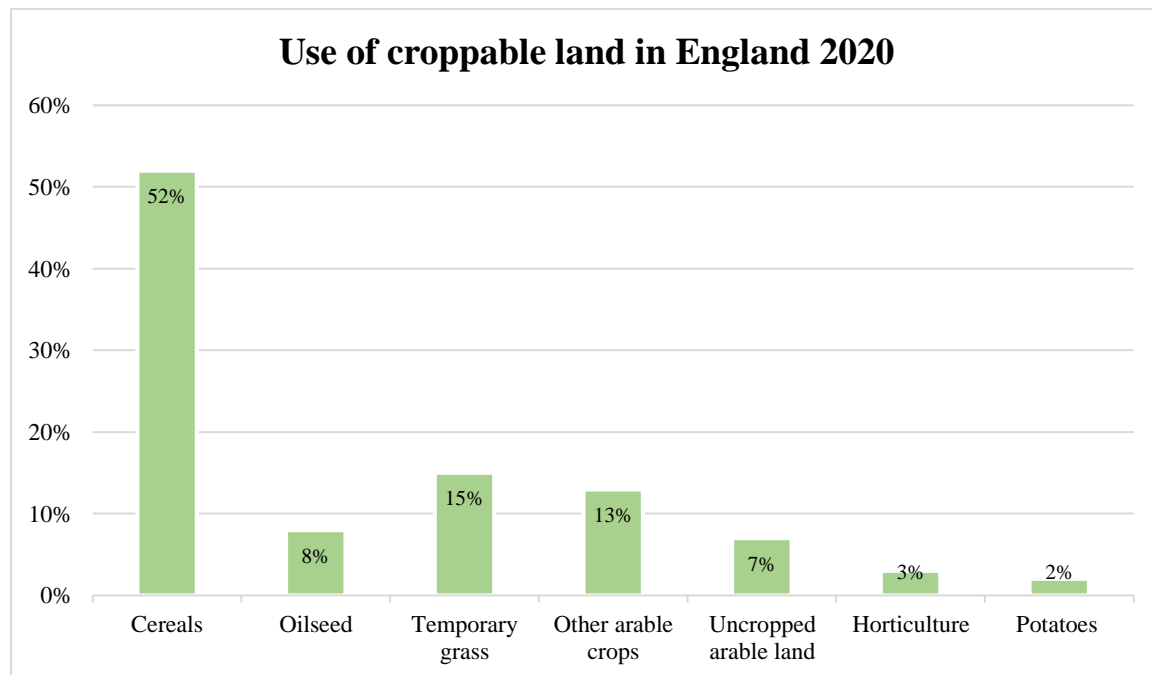


Figure 13: Distribution of use of croppable land in England in 2020
Source: Own creation based on Defra, 2020.

Due to Brexit, England is currently in a transition phase, including the agricultural sector. In 2021, the government began its 7-year transition period, moving away from the set rules by the EU. The key goals of this transition are to move away from the Basic Payment Scheme, close existing agri-environmental schemes, and start a new approach by delinking payment. England is focusing on paying farmers to improve the environment, reduce their CO₂ emissions and increase animal well-being. Thus, farmers and landowners will get paid for nature-friendly practices. Furthermore, they aim to decrease the focus on penalties as a default response if some rules are broken or bent. The government aims to develop the new scheme in cooperation with farmers and the wider industry and thus to find an approach that works for all (Defra, 2020a).

In the UK, including England, there has been a decline of wild and managed pollinators for the last 50 years (Downing & Sutherland, 2017) (Figure 14). Currently, data is only available for the UK in general and not divided by the four countries. Some research suggests that there are approximately 500 species of wild pollinators in the UK; however, it is often estimated to be more (RHS, 2021; Defra, 2014). Nonetheless, even though the importance of the pollinators is emphasized in almost all UK governmental documents and research, there is still no robust large-scale and species-specific calculation about the distribution change in the UK. The only available information is from field-scale experiments, which usually assess short periods (Powney et al., 2019). This is true for most wild pollinators but not for the honeybee. Nevertheless, there is a great deal of information available on the honeybee (Defra, 2014).

Furthermore, it was established that to prove the pollinator decline, a systematic and standardized monitoring program of the abundance of pollinators is needed (Vanbergen et al., 2014). Thus, due to these gaps in data, the UK pollinator monitoring and research partnership were established in 2017 (Downing & Sutherland, 2017). Ever since then, it has been essential to evaluate the abundance of insects and the diversity of species and has been used as a base for new targets and measures (FSC, n.d.).

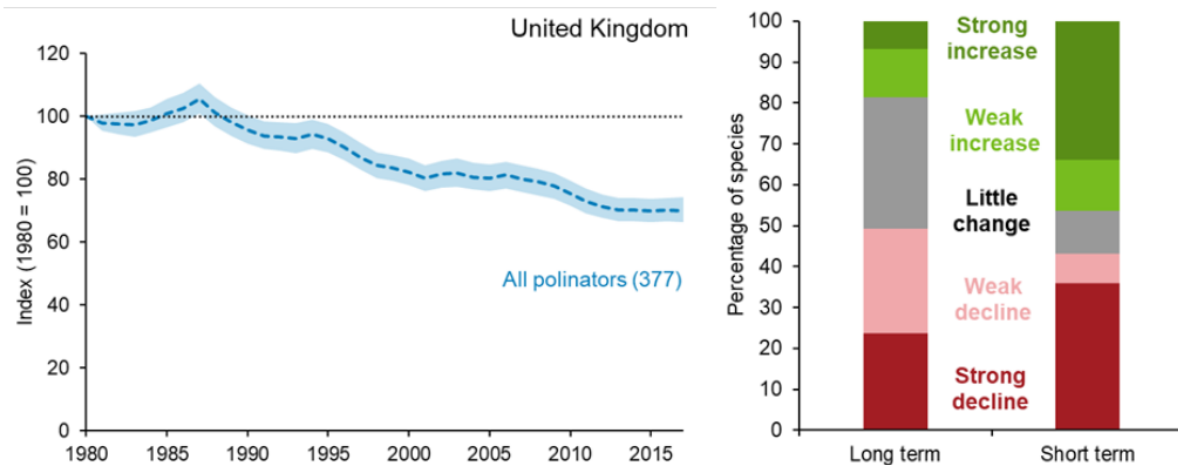


Figure 14: Changes in distribution of wild pollinators, 1980–2017, in the UK

Source: Powney et al., 2020

However, it has been established that this downward trend in pollinators is not universal; thus, not all species are in decline. In the UK, bees and hoverflies are seen as the key indicator species because they are the ones that pollinate the most crops grown in the UK. Downing and Sutherland (2017) state that, in the UK, bees and other pollinator insects are declining in number simultaneously to the plants that rely on them. However, the number of managed beehives has been stable and has even increased a little. Downing and Sutherland (2017), furthermore, state that it is neither bumblebees nor solitary bees that are threatened because they can collect pollen and nectar from a variety of plants; instead, species that are more selective or have special nest requirements are declining. Furthermore, it is said that, in the UK, a decline of moths and butterflies has been noted, which is associated with the land-use change. It is unclear, however, why there is an abundance of other pollinators, such as hoverflies (Downing & Sutherland, 2017).

In the years between 1980 and 2014, it was established that 32% of the pollinator species in the UK have declined, and 10% showed a strong decline (Downing & Sutherland, 2017). Figure 14 shows this downward trend and also offers a difference between the temporal patterns of decline. It can be seen that a more severe reduction was observed in recent times, approximately after 2007 (Powney et al., 2020). However, this trend might vary if the focus changes to individual pollinator species.

4.2.1 Characterizing the Mode Governance in England

In England, after the first assessment (see Figure 3), 11 relevant initiatives were identified (see Appendix J **Error! Reference source not found.**). Figure 15 shows the distribution of the modes of governance of the identified initiatives.

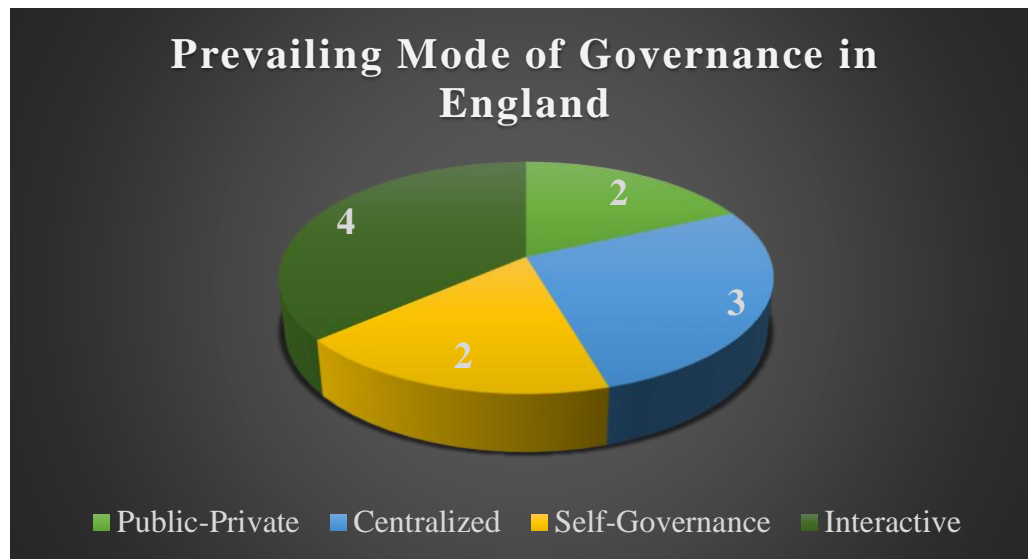


Figure 15: Prevailing mode of governance in England

Source: Own creation

Compared to Germany, in England, no mode of governance is prevailing. This was also supported by Expert 1. However, most of the 11 initiatives were either interactively governed (four) or centrally governed (three). There was no de-centrally governed initiative, and thus it was excluded from this figure.

Expert 2 mentioned that there are policy initiatives in England, but many NGOs work with farmers and have pollinator protection goals. He also considered the industry as an essential driver of farmer behavior and activity concerning pollinators. Thus, he does not think that there is a prevailing mode of governance in pollinator protection in England. The Department for Environment, Food and Rural Affairs (Defra), however, seems to be the main actor in most of the identified initiatives.

Defra is a UK government department that focuses on protecting and enhancing the natural environment and the food and farming industry. It also focuses on a healthy rural economy (Defra, n.d.). Widespread pollinator protection action is currently predominantly done by the policy, initially through the CAP and the Countryside Stewardship Scheme (CSS). The CSS is now transitioning to the Environmental Land Management Scheme (ELMS), which works similarly and is trying to make pollinator measures more effective. The CSS gives financial support directly to farmers to implement certain practices (more details on this in the next chapter).

Figure 16 shows that the main reason for excluding initiatives was that they either did not target wild pollinators or did not have any tangible output for the farmer and thus were mainly created to gather information (knowledge creation). Interestingly enough, these were also the same main excluding factors in Germany (see Figure 9).

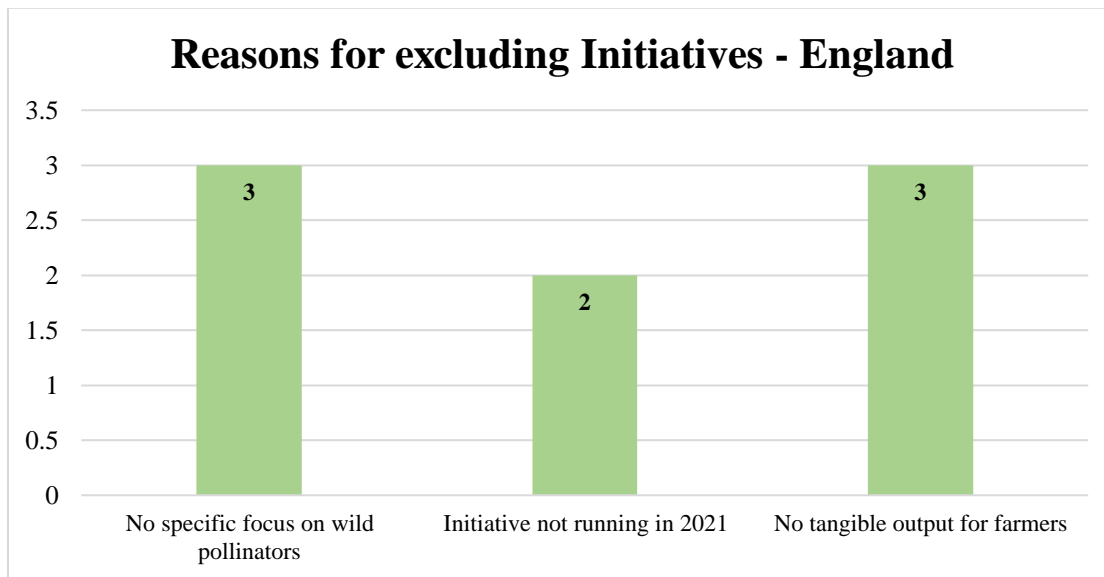


Figure 16: Reasons for excluding initiatives in England

Source: Own creation

In this analysis, three relevant initiatives were found in England, which have been further assessed (Table 17).

	National Pollinator Strategy	Countryside Stewardship Scheme	B-lines
Explanation	Shared plan between government and stakeholder to tackle wild pollinator decline → Focus on habitat creation	Monetary reward for farmers who implement pollinator friendly measures → in-field options and non-farmed habitat options	Focusses on restoring and mapping wildflower habitats in England and rest of UK
Mode of Governance	<u>Public-Private</u>	<u>Centralized</u>	<u>Interactive</u>
Main Actors	Defra (Department for Environment, Food and Rural Affairs); Wildlife Trust; Bee Farmers’ Association etc.	Defra	Buglife (NGO) Farmers, Defra
Main Goals	<ul style="list-style-type: none"> • More, larger flowery areas and hedgerows i.e. habitat creation • Health and resilient pollinators • Enhance Pollinator awareness • Work with farmers through CAP and with voluntary measures 	<ul style="list-style-type: none"> • Provide financial incentives for farmers to farm sustainably → with a specific focus on maintaining pollinators and other wildlife • Conserve and restore wildlife habitat • Keep characteristics of the countryside 	<ul style="list-style-type: none"> • Connect wildlife areas • Support the National Pollinator Strategy • Conserve wild insects • Pollinator resilience for climate change
Policy Instruments	<ul style="list-style-type: none"> • Pollinator events • Fines for mandatory measures • Advertisement for free seeds 	<ul style="list-style-type: none"> • National Pollinator Strategy (NPS) • Penalties • Site visits • Minimum requirements 	<ul style="list-style-type: none"> • Educational exchange • Previous experiences/projects on website • Map on their website to see the progress

Table 17: Summary of relevant initiatives in England

Source: own creation

4.2.1.1 National Pollinator Strategy

Since 2014, England has had its own national pollinator strategy (NPS). Defra published this strategy; however, it is a shared plan created by the government and stakeholders, such as Bee Farmers Associations, and NGOs, such as Buglife and the Royal Horticultural Society. The main idea is that everyone should work collaboratively. In the NPS, five key outcomes and target areas are addressed, with a goal to achieve them by 2024. One of the key areas is agricultural landscapes (CBD, 2018).

The main goal of the NPS in agricultural landscapes is to create more habitat for pollinators with the creation of more and larger areas of flowers (Defra, 2014). Expert 1 also mentioned that hedgerows play an essential role in England to maintain the pollinator population. He explained that hedgerows are great for nesting resources, especially if they are not heavily managed. The NPS also aims to increase the general health of pollinators to increase their resilience to climate change. Furthermore, it seeks to have a clear idea of the pollinator trend and to stop the decline of wild pollinators, including raising awareness around the decline (Defra, 2014).

The NPS is based on the mandatory measures from the CAP and voluntary measures. In England, it is compulsory, as it also is in Germany, to meet its 5% ecological focus areas requirements. This can be done by through land lying fallow and by planting buffer strips, hedges, nitrogen-fixing crops, catch crops or green covers. Furthermore, based on the NPS, new practices, such as integrated pest management, were created to reduce risk factors, such as pesticides for pollinators (Defra, 2014). The NPS works with policy instruments, such as pollinator events and free flower seed mixes for farmers. It also conducts field visits and hands out fines if the measures are implemented incorrectly (Defra, 2014).

4.2.1.2 Countryside Stewardship Scheme

The CSS gives incentives for land managers to take care of the natural environment. It is made up of different elements. One of the elements is the Wild Pollinator and Farm Wildlife Package (Defra, 2021). The CSS gives financial support for all farmers, woodland owners, or land managers who participate and improve their environment (UK Government, n.d.). Different targets or packages can be chosen within this scheme, such as wild pollinators (Defra, 2021). Within the Wild Pollinator scheme, farmers can apply for three different packages: the arable package, the mixed and the pastoral. However, if farmers have a mixed farm, they do

not need to apply for the mixed package. Farmers can choose the package that is the most suitable for their farm. Each package, however, includes several measures that farmers can implement. These measures focus primarily on nectar and pollen sources, increasing nesting habitat and winter food (for birds). However, they also focus on preserving the characteristics of the countryside. From the list of options, farmers can choose as many as they like; the more they choose, the better for the natural environment and the targeted wildlife (UK Government, 2021).

However, the package has a minimum number of requirements that must be followed. Firstly, there are mandatory categories from which at least one measure must be implemented. Secondly, minimum hectare requirements must be followed (e.g., for hedges or flower strips). Additionally, these measures must be used for at least 3% of the farmland (Defra, 2021).

After implementing the measures, the farmers and the measures are evaluated by Defra and scored. If measures target a hotspot for pollinators or other wildlife, special points are rewarded. After the implementation of the measures, the farmers can claim reimbursement. There are strict rules for this, which are publicly available (Defra, 2021). The CSS is currently in a transition phase. It will be fully replaced by the ELMS by 2024.

The Defra centrally governs the CSS; however, other stakeholders are consulted before publishing it, such as the forestry commission, Natural England or the European Agricultural Fund for Rural Development. The initiative's main policy instruments include penalties if the minimum requirements are not achieved, the set of minimum requirements, site visits and a scoring system to make sure that farmers implement the measures. With the options of measures, the initiative also aims to support the NPS and to act through it (Defra, 2021; UK Government, 2021a).

4.2.1.3 B-Lines (by Buglife)

The NGO Buglife initiated the B-Lines project; however, it is interactively governed. Buglife focuses on protecting and enhancing all invertebrates in the UK, but they predominately focus on pollinators and freshwater habitats. Regional and national governments have adopted many of the projects initiated by Buglife. For example, their flagship project B-Lines has been funded by all UK governments and is seen as integral to their pollinator strategies (Buglife, n.d.).

The B-Lines project targets the loss of habitat of wild pollinators. This includes the loss of habitat in all landscapes, such as agriculture, forests or cities. Buglife describes B-Lines as

imaginative lines which represent insect pathways across England and the rest of the UK. These insect pathways create a network and connect existing wildlife areas. Shown on a map, it looks like a railway throughout the UK. To create these pathways, existing habitats are connected, but new large areas, especially for pollinators, are needed. This project aims to connect as many wildlife areas as possible and increase habitat for wild pollinators and other wildlife.

The aim is thus to conserve wildlife and have resilient pollinators for climate change in the coming years. Ideally, Buglife intends to create and restore a minimum of 150,000 hectares of flowery habitat in the UK. It wants to achieve this by working together with farmers and landowners and businesses, local authorities and the general public. The participation is voluntary but can be connected with other schemes, such as the CSS, to receive payment.

Buglife's main policy instrument is educational campaigns to reach as many people as possible and spread its message that every individual can participate, even if they only have a roof or a balcony. Furthermore, Buglife has included its experiences and previous projects on its website for credibility. Additionally, it has created a map of connected habitats so the process can be monitored. Everyone can add their project and the size of their area of flowers based on regions in the UK (Buglife, n.d.-a).

4.2.2 Assessing the Perceived Effectiveness of Wild Pollinator Governance Arrangements in England

In this subsection, the three identified initiatives in England's NPS, CSS and B-Lines are assessed on their perceived impacts and peculiarities. For the IA in England, interviews were held with two experts and four farmers, and additional desk research was done.

4.2.2.1 The National Pollinator Strategy

The NPS achieved an overall score of 6, including all four conditions and the scope and quality in the IA (see Table 18).

Condition	Fullfillment	Score
Scope	High	
	Moderate-High	
	Moderate	1
	Moderate-Low	
	Low	
Quality	High	
	Moderate-High	
	Moderate	1
	Moderate-Low	
	Low	
Motivation	High	
	Moderate-High	

	Moderate	
	Moderate-Low	
	Low	0
Demand	High	
	Moderate-High	1.5
	Moderate	
	Moderate-Low	
Ability	Low	
	High	
	Moderate-High	
	Moderate	1
Legitimization	Moderate-Low	
	Low	
	High	
	Moderate-High	1.5
	Moderate	
	Moderate-Low	
	Low	
Overall Score		5

Table 18: Score distribution NPS

Source: Own creation

The *scope* of this initiative was considered to be moderate, and thus 1 point has been given. The initiative targets all farmers in agricultural landscapes; however, there is a focus on cereal farmers (Defra, 2014). Some measures are very hard to implement for dairy farmers, for example due to smaller field sizes (Farmer 2).

The *quality* of the initiative has been considered moderate-high. The NPS states very clear goals in regard to the operationalization of the goals and updating plans (Defra, 2014). It is regarded as a leading initiative to get a good overview of the current pollinator situation. Still, it needs to be connected to other initiatives to implement the measures (Experts 1, 2), especially since there is no monetary reward. However, the initiatives partly play a role in different governance arrangements, such as the CSS.

The *motivation* of farmers to participate in this governance arrangement is low, and thus 0 points were given. Since two of the interviewed farmers were dairy farmers, they stressed that the mandatory measures do not make sense. The initiative focuses much more on farmers that are dependent on pollinators. However, dairy farmers are usually not reliant on them, so those farmers should benefit from their participation. Since there is no monetary compensation, most farmers do not receive enough benefits to warrant participating (Farmers 1, 2, 3).

Additionally, all farmers mentioned that their motivation to implement pollinator measures is always based on civil society's negative opinion. However, working with fines and strict regulations is not appealing. Moreover, some measures and goals appear not to be

realistic, and farmers do not benefit from this initiative but might have to pay fines or penalties if the measures are not implemented perfectly (Farmers 3, 4).

The *demand* for the initiative was considered moderate-high because some measures are mandatory under the CAP, but also voluntary measures are used. Thus, the most suitable one from the voluntary measures can be chosen and ideally be adapted. However, rules by the Defra still need to be followed. Additionally, all farmers mentioned that there is societal pressure to implement some measure, and the NPS is a good starting point to do so (Farmers 1, 2, 3, 4). Additionally, it is considered an advantage that there is much interaction between the public, the government and farmers (Experts 1, 2).

The *ability* of farmers to participate was considered moderate. It does not appear that specific knowledge is needed to participate in this initiative; everything needed can be found in a comprehensive document. However, farmers need time to go through it, and thus the bureaucracy involved was stated as another reason not to participate (Farmer 1). Additionally, a farmer criticized that the initiative claims that it has created the measures and goals in collaboration with farmers and farmer associations; however, he does not believe this because the goals appear unrealistic (Farmer 2).

The *legitimization* of this initiative was considered moderate-high because of the combination of stricter mandatory measures that give the farmers some autonomy and voluntary measures (Farmers 1, 4).

4.2.2.2 Countryside Stewardship Scheme

The CSS is the initiative that has achieved the highest score of all initiatives, including the ones in Germany. It achieved a score of 7.5 (see Table 19).

Condition	Fullfillment	Score
Scope	High	
	Moderate-High	
	Moderate	1
	Moderate-Low	
	Low	
Quality	High	
	Moderate-High	
	Moderate	1
	Moderate-Low	
	Low	
Motivation	High	2

	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	
Demand	High	
	Moderate-High	1.5
	Moderate	
	Moderate-Low	
	Low	
Ability	High	
	Moderate-High	
	Moderate	
	Moderate-Low	0.5
	Low	
Legitimization	High	
	Moderate-High	1.5
	Moderate	
	Moderate-Low	
	Low	
Overall Score		7.5

Table 19: Score distribution CSS

Source: Own creation

The CSS has a moderate *scope* and thus received 1 point. Defra itself states that all farmers can participate, farmers can choose their farming type (e.g., cereal, dairy, etc.), and suitable measures are proposed (Defra, 2021). However, some farms are too small to participate and cannot implement the measures; therefore, they are excluded (Farmer 2; Defra, 2021).

The initiative's *quality* was considered moderate because it has published clear goals (Defra, 2021), but there is no updated plan nor an idea of how it measures its success. However, farmers consider the compensation for implementing the measures to be excellent (Farmer 1) and even went as far as calling it the best initiative (Farmer 4).

The CSS is the only initiative for which farmers had high *motivation* to participate. The main reason for this is because it offers monetary benefits for farmers (Farmer 1). Participation in this initiative mainly has two reasons. The intrinsic motivation for the efficient implementation of pollinator-friendly measures and the idea that they get money for it makes up for their costs (Farmer 1, 2, 3 4). In this initiative, fines are also used, and thus some farmers are afraid of the punishment (Farmer 3). However, since the reward appears to be so appealing, it outweighs this fear. Additionally, Defra aims to change the fine and penalty procedure after Brexit and the move to ELMS.

The *demand* for the initiative is moderate-high because the participation is voluntary (Defra, 2021). However, if farmers decide to participate, there are precise rules to be followed, and an assessment of farmers' progress is made annually (Defra, 2021; Experts 1, 2).

The bureaucracy is very time-consuming and complicated; thus, the *ability* of farmers to participate was considered moderate-low. In this initiative, farmers do not have many options for adapting the measures, which would have been significant for small-scale farmers. However, even though the farmers have much work to do to implement measures and participate, it is still considered worth it (Farmers 1, 2, 3, 4). Furthermore, the minimum requirements created by the initiative excludes small-scale farmers (Farmer 2, Expert 2). Lastly, farmers need reporting skills and need to be able to keep up with the minimum requirements to see if they are still eligible to participate and if any of the mandatory measures have changed (Defra, 2021; Expert 1, 2).

The *legitimization* is considered to be moderate-low because it only focuses on individual farmers, and farm clusters are neglected. This initiative additionally distinguishes between farm types, but this distinction is not very detailed. Moreover, even though the rules and the fines seem strict at first glance, once they are read thoroughly and understood, it is a straightforward procedure (Farmer 4).

4.2.2.3 B-lines

The interactively governed initiative B-Lines scored the lowest out of England's initiatives. The initiative achieved a score of 5 (see Table 20).

Condition	Fullfillment	Score
Scope	High	2
	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	
Quality	High	
	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	0
Motivation	High	
	Moderate-High	
	Moderate	
	Moderate-Low	0.5
	Low	
Demand	High	
	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	0
Ability	High	2

	Moderate-High	
	Moderate	
	Moderate-Low	
	Low	
Legitimization	High	
	Moderate-High	
	Moderate	
	Moderate-Low	0.5
	Low	
Overall Score		5

Table 20: Score distribution B-lines

Source: Own creation

B-Lines scored high in its targeted *scope* because it addresses all types and sizes of farmers, and everyone interested who has a field or garden in England or UK-wide can participate. Furthermore, there is flexibility in the measures implemented and the size of them. Thus, farmers can individually decide which measures to use (Buglife n.d.a).

However, the initiative scored low on *quality*. Buglife states the initiative's goals very precisely. However, there are no checkups or updates, and most goals they mention are not measurable. Furthermore, the participation is entirely voluntary, and there are no rules or guidelines to follow. It is not complex and not time-consuming; however, intrinsic motivation is needed for this initiative (Expert 1, Farmers 1, 3). There are also no assessments or reports on their progress except a map on their website with connecting lines but no proof of tangible data.

Furthermore, the *motivation* of farmers to participate was only moderate-low. Farmers and experts agreed that the initiative is not very well known. The main initiator, the NGO Buglife, however, is well known. Nonetheless, the approach the initiative takes is considered attractive as it aims at connecting different landscapes. However, since farmers do not benefit from it (Farmer 1) and there is no compensation, the motivation is not very high (Farmers 2, 4).

Additionally, the *demand* for the initiative is low, mainly because the initiative is entirely voluntary, and there are no guidelines to follow. There is a general societal pressure to protect biodiversity in agricultural landscapes; however, intrinsic motivation appears not to be motivation enough for farmers to transform parts of their field to flower strips or hedges without any benefit (Farmers 1, 2, 3, 4).

The *ability* of farmers to participate in this initiative was considered to be high, mainly because there are hardly any technical requirements needed for the farmers (Buglife, n.d.a) and

no minimum requirements or farm size to participate. Additionally, farmers can adjust and experiment with the measures the way they see fit (Expert 1; Farmers 2, 4).

4.2.2.4 Overall Assessment England

In England, compared to Germany, a greater difference between the scores has been established. The centrally governed initiative CSS has received the highest score out of all initiatives, including the ones in Germany (see Figure 17). Thus, in England, like in Germany, a central mode of governance for the wild pollinator protection has been established to be the most effective.

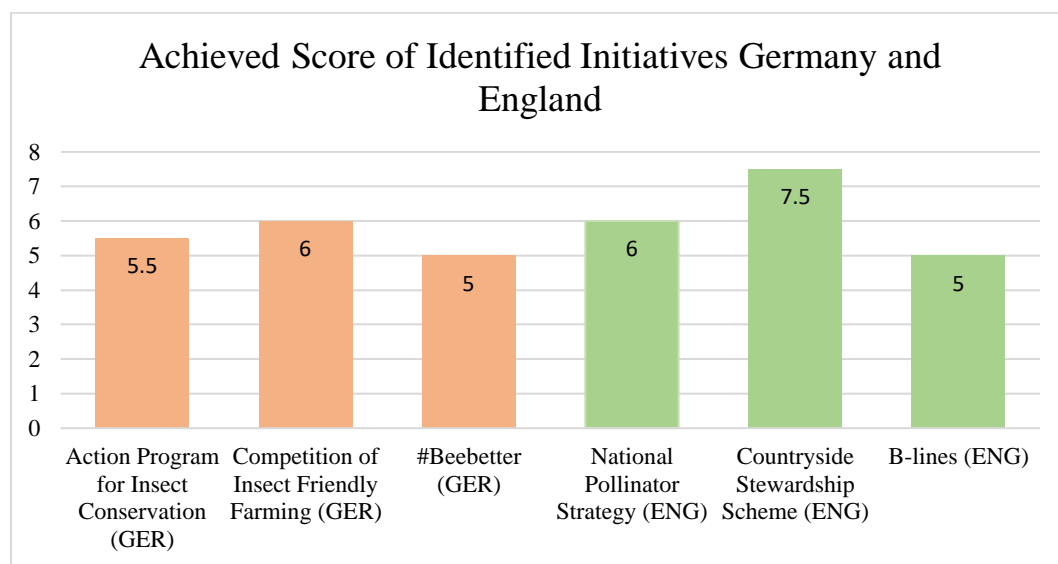


Figure 17: Achieved score of initiatives - Germany (orange) and England (green)
Source: Own creation

Additionally, the motivation of farmers to participate was the highest for the CSS of all initiatives, mainly because of the monetary benefit, which outranked the potential fines and the fewer opportunities to freely decide which measures are suitable for which farm (see Figure 19).

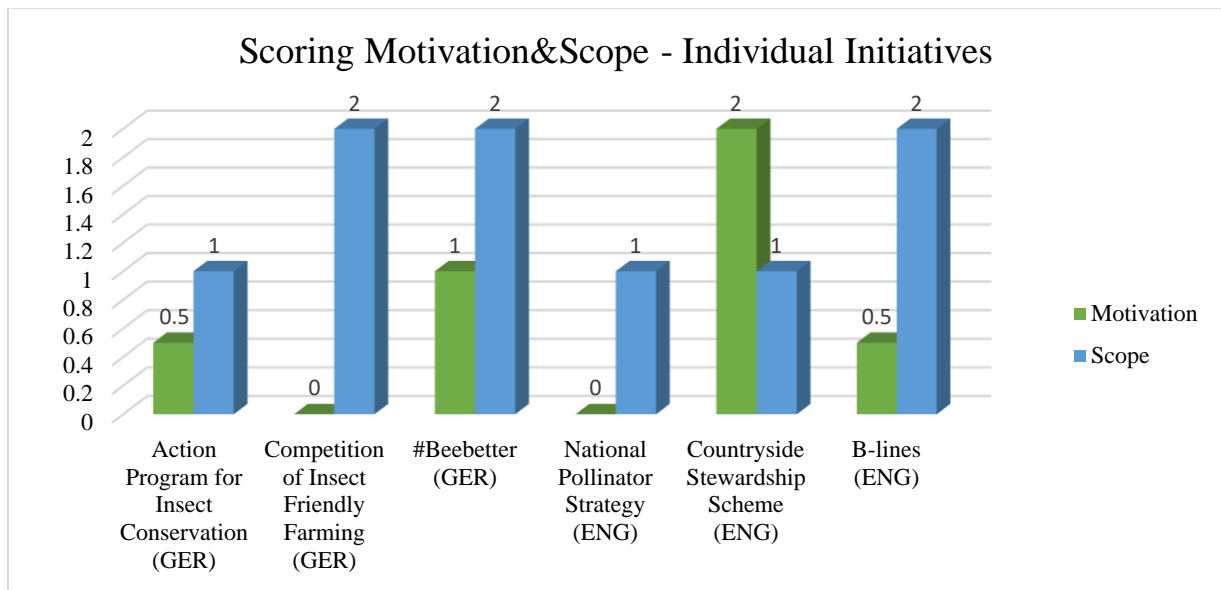


Figure 18: IA scoring motivation and scope of individual initiatives
Source: Own creation

However, interestingly, the centrally governed initiatives in both countries have a lower scope than the interactively governed initiatives (Figure 18). This is surprising since the centrally governed initiatives seemed to be bigger and seemed to focus on including all farmers. However, after further assessment, in both countries it seemed that the measures that could be implemented were mostly on-field measures, which are impossible for dairy farmers to implement for example and therefore decreased the scope of centrally governed initiatives. The interactively governed initiatives in both countries left it open for farmers to choose their measures, and therefore all farmers were targeted because they could implement measures based on their farming style and landscape context.

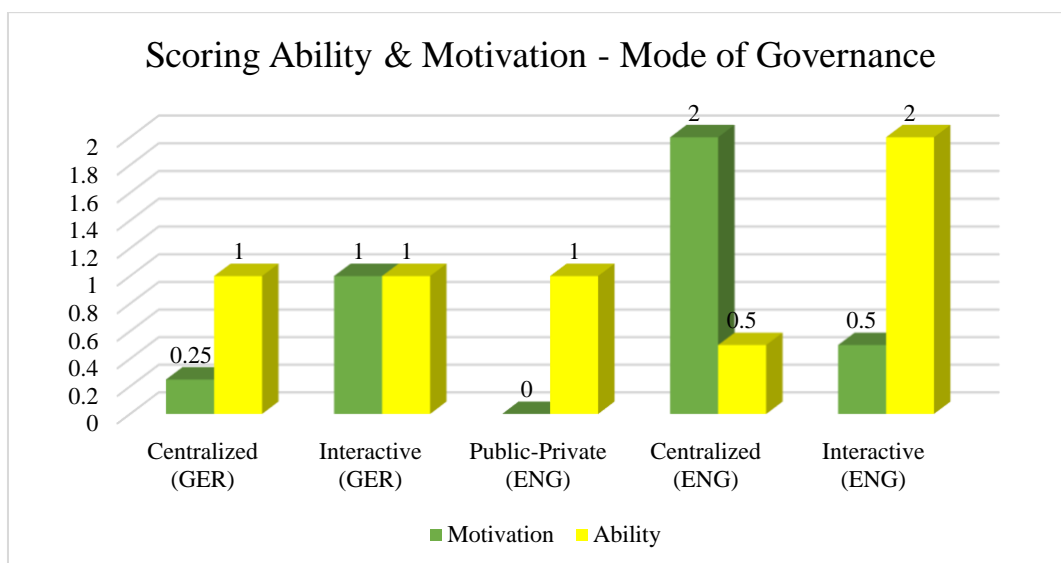


Figure 19: IA scoring motivation and ability – Mode of Governance
Source: Own creation

Overall, this analysis showed, when taking motivation, demand, ability, legitimization and scope and quality into consideration, the centrally governed initiatives appear to be more effective concerning the uptake by farmers (see Figure 20). However, none of the initiatives scored higher than 7.5, which is only slightly more than half the points that could have been achieved.

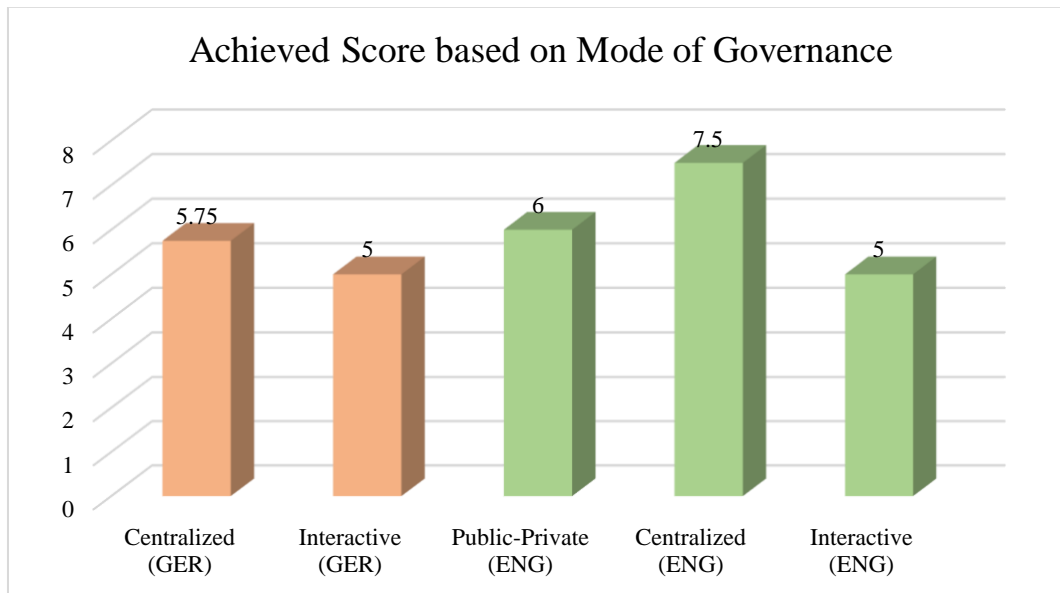


Figure 20: Achieved score, based on the mode of governance in Germany (orange) and England (green)
Source: Own creation

In Germany, this is connected to the low motivation of farmers concerning their participation in centrally governed initiatives. In England, centrally governed initiatives did not receive a higher score than 7.5 mainly because of the low assessment for the farmers ability to participate (Figure 19). Most centrally governed initiatives in England are connected with minimum requirements for farmers to participate. These requirements often include a minimum field or farm size; thus, small-scale farmers are systematically excluded from these initiatives, which decreases their effectiveness and the uptake by farmers.

4.2.3 Lessons Drawn from England

In England, farmers showed in general more motivation to participate in initiatives when they benefit from their participation. In general, monetary benefits seem to create the highest motivation, considering the financial means they need and the time they have to put in to implement measures. Farmers are mainly motivated to participate in the centrally governed CSS, which offers farmers precisely this kind of benefit even though it is connected to a considerable amount of bureaucracy. Farmers especially appear to be interested in the Payment by Result Scheme, which the UK government wishes to implement once they have left the EU.

This will reward farmers for environmentally friendly farming and will protect nature and wildlife, instead of focusing on minimum requirements, penalties and fines. Currently, however, England still follows the mandatory requirements by the CAP (Defra, 2020a).

Additionally, what seems to motivate farmers is that the English government does not monopolize wild pollinator protection, which appears to also increase the demand. Nonetheless, the government is trying to involve all stakeholders and take farmers' needs and ideas into consideration to create achievable and reasonable measures. Sometimes, it even takes landscapes and farming styles into consideration, which is essential, according to the experts.

Additionally, in the 11 initiatives identified, most aimed at the intrinsic motivation of farmers, and participation was voluntary. However, solely relying on the intrinsic motivation of farmers might not be enough to counteract the decline of wild pollinators. Often, the farmers are interested in a participation; however, time and financial incentives are lacking, and thus participation might not be as high as desired.

Furthermore, it appears to be essential to have a pollinator monitoring scheme, which is the case in England. With the help of the monitoring scheme, trends can be established, and the identification of which species are in decline in which area can be assessed. Based on these numbers, measures to counteract the decline of specific species can be created, and this might be more effective for the diversity and abundance of pollinators.

Thus, England's approach of having one central ministry responsible for agricultural matters appears to be more effective. Additionally, its approach of combining a mandatory framework with adaptable measures for farmers based on their farming style appears to be appreciated by farmers. Lastly, monetary rewards or compensation in English centrally governed initiatives appears to outweigh barriers such as high bureaucracy or a fear of fines.

4.3 Transfer of the Most Effective Mode of Governance and Initiative

Based on the analysis of the mode of governance and the effectiveness of wild pollinator protection initiatives in Germany and England, it can be seen that there is no silver bullet when looking for an effective pollinator protection initiative. Both countries face issues that compromise the effectiveness and the uptake of governance arrangements. One possible solution could be to analyze what works in one country and what does not and transfer goals, instruments, programs or ideas to the other country. By analyzing and identifying the most effective initiative and mode of governance in either country (RQ2), lessons could already be learned. By taking the socio-economic and cultural background of the two countries into

consideration, an assessment of a possible PT of whole initiatives, perspectives, goals or policy instruments can be given.

4.3.1 Germany: Geographic, Socio-Economic and Cultural Background

The Federal Republic of Germany is at the center of Europe, and it has approximately 82.8 million inhabitants, making it one of the most populated countries in the EU (European Commission, 2021). The landscape in Germany varies across areas: mountainous areas in the south, vast sandy plains in the north, forestry, and more urbanized areas in the west, and mostly agricultural land in the east (Hamerow, 2021). Today, the most common soils in Germany are temperate brown and deep brown soils, which depend on relief, specific hydrologic conditions, vegetation and human intervention. The most fertile soils can be found in the northern part of the Central German Uplands, the Rhine Valley and the Alpine Foreland, and most of this land is arable land under cultivation (Hamerow, 2021).

Since 1949, Germany has been a democratic and social federation. Therefore, the primary responsibility for legislation lies with the states (Länder). After the reunification of West and East Germany, there are now 16 federal states within Germany (Hamerow, 2021).

However, policies in relation to defense and foreign affairs are decided by the federal government. Both the federal and state government prevail in parliamentary democracy (Hamerow, 2021).

After World War II, the organization of agriculture and settlement was different in East and West Germany. Federal and state governments in West Germany gave large subsidies for improving existing structures, and thus larger holdings were created, and some farmers were moved outside of villages. However, there were only a handful of full-time farmers, and therefore the land was left uncultivated as afforested or grass areas.

In East Germany, however, private estates were confiscated and often turned into state farms. Additionally, large-scale animal husbandry was created. These different impacts can still be seen in the distribution and sizes of farmers around Germany (Kroll, 2010; Hamerow, 2021).

Germany additionally has been shaped culturally through its philosophers from the middle ages onwards. Furthermore, modern natural science and the connected decline in religion can be based on German philosophy due to an increase in questions concerning the relationship between science and ethics. Additionally, Germany is considered a country of

investors and engineers, which shapes the German economy. Furthermore, it is shaped by a plurality of lifestyles and is regarded as a modern and advanced society (Kroll, 2010).

4.3.2 England: Geographic, Socio-Economic and Cultural Background

England is part of the United Kingdom of Great Britain and Northern Ireland. The UK is a parliamentary democracy with a constitutional sovereign as its head of state. Scotland, Wales and Northern Ireland have separate governments. However, England's legislation is passed by the UK Parliament. England holds approximately four-fifths of the UK population (European Commission, 2020).

The British monarchs were the executing power until the late 17th Century; however, they still had to follow the law (European Commission, 2020a).

England is surrounded by large rivers, small streams and fertile land. Thus England's soil fertility has helped to establish a thriving agricultural economy. Agriculture was the major economy in England until the Industrial Revolution. In the Industrial Revolution, England became the most industrialized country and the center of the revolution. Today, England is still mainly an industrial country using coal mines, quarries and clay pits. However, compared to other countries in the UK, the physical environment in England is more favorable for agriculture (Kellner & Hartford, 2019).

To the North of England is Scotland, and to the west is Wales. It does not have much elevation except in the east. England's landscape is diverse, and so is its soil structure. Within a couple of miles, it is possible to pass through different types of soil varying from chalk to limestone to sand. Each type of soil comes with a different set of vegetation. However, today's modern landscape has significantly been changed by humans, and there is little wilderness left except for some remote moorlands or the tops of mountains (Kellner & Hartford, 2019).

The English culture is also very diverse and has been influenced by Asians, Muslims, Afro-Caribbeans and other groups through the expansion of the British Empire. England, today, has a strong cultural impact on the rest of the world concerning the music, film and literature industry (Kellner & Hartford, 2019).

4.3.3 Policy Transfer: Germany to England

Promising to transfer from Germany to England is the idea of hosting wild pollinator awareness creating competitions, not necessarily as stand-alone initiatives but as part of the NPS to increase knowledge exchange and to promote innovation. Competitions appear to be interesting for farmers, even though some people think that farmers should be urged to collaborate rather than compete (Farmer 2). Furthermore, competitions are a tool that Germany often uses to foster innovation and to encourage farmers to implement more voluntary measures and to increase awareness of the current downward trend of pollinators. In England, these types of competitions are rare. Thus, it may be useful to implement such a competition, considering specific landscape contexts and therefore increase the scope and considering farmer clusters instead of individual farmers to increase the demand.

From a geographic perspective, Germany and England are close together; however, their landscapes and social and economic characteristics, such as how the government is constituted, vary. Furthermore, cultural and historical differences have been established: England has grown mostly in relation to culture, literature and agriculture, and Germany has been more focused on philosophy and engineering. Knill (2005), Lenschow et al. (2005) and Hood (2007) all state that geographical proximity but also shared or similar cultural, social and economic characteristics improve a successful PT. If countries are very different, constraints can occur.

The IA shows that the initiatives in Germany appear to be less effective than the ones in England, especially the centrally governed ones. This is mainly because the lack of motivation of farmers to participate in the initiatives decreases their effectiveness. Therefore, it is not appealing to England to transfer any of the initiatives from Germany. However, England can still draw motivation from the scoring that has been presented in this thesis.

Firstly, scoring higher than Germany could give England a positive signal that they are going in the right direction. However, none of England's initiatives scored higher than 7.5 (out of 12), so there is room for improvement. Based on the interviews with farmers and experts, it seems that a move away from the Common Agricultural Policy (CAP) is considered positive. If a move away from the CAP is perceived positively, this could also be a lesson for Germany or inspiration to consider other options.

Constraints of this kind of PT or lesson-drawing are that those lessons might be acknowledged but not taken seriously and not actually taken into consideration when creating new initiatives. Additionally, Dolowitz and Marsh (1996) state that if there are time constraints and if there are already working policies in place, this can hinder PT, and inertia can occur.

4.3.4 Policy Transfer: England to Germany

The IA in Germany shows that the three identified initiatives all scored approximately on the same relatively low level, without there being one distinct initiative. In general, especially because of farmers' very low motivation to participate in these initiatives, the identified German initiatives are considered less effective. Therefore, PT could be a possible solution.

The most effective initiative in England is the CSS, which also achieved the highest score of motivation of farmers to participate. However, an emulation of this initiative seems to be most realistic compared to copying this governance arrangement. Thus, adjustments can be made to fit the circumstances prevailing in Germany. Additionally, adjustments concerning landscape context and farming style could also be made. With this, Germany could increase farmers' motivation to participate in pollinator protection initiatives, especially centrally governed ones.

If Germany would emulate this initiative, England could learn lessons from this; for example, if the bureaucracy involved would be decreased and if the fines would be made less strict, perhaps the uptake would increase, from which England could profit. The main actors in this transfer would be central actors – the Defra in England and the BMU, BfN and the BMEL in Germany.

However, since one of the main issues in Germany is the negative perception of farmers towards the governmentally initiated initiative, it is unclear how much they would be able to change this opinion by implementing another centrally governed initiative.

Additionally, Dolowitz and Marsh (1996) also state that copying a whole initiative from one country to another is very rare. Usually, policymakers copy some aspects and create hybrids, where they include elements from the policies of one country or several countries. Thus, it would be interesting, not only for Germany but also for England, to identify countries in which the uptake of wild pollinator protection initiatives, the motivation of farmers to participate, and the effectiveness of the initiative, also concerning the increase in the number and diversity of pollinators is high. If this were to be done, practices, goals and policy instruments could be analyzed, and lessons might be learned again.

5 Discussion and Conclusion

In this research the prevailing mode of governance in England and Germany concerning wild pollinator protection was analyzed. Furthermore it was assessed whether the mode of governance affects initiatives perceived effectiveness, which are the most effective initiatives in either country, and what motivates farmers to participate in them. Moreover, it analyzed what lessons could be drawn from the countries and if there is a policy that could be transferred.

This chapter will firstly address the research's contribution to literature, its limitations in the *discussion* part and future research options. In the second part, the *conclusion*, i.e. an elaborate on the findings, answer of each research question, and recommendations will be given.

5.1 Discussion

This chapter discusses how this thesis added to current literature, what was missing in the used frameworks by Driessen et al. (2012) and Runhaar et al. (2017) and it discusses the limitations and future research.

5.1.1 Scientific Relevance

Current scientific research in the case of the wild pollinators, focusses on understanding the reasons for their decline (Holzschuh et al., 2008; Tirado, Simon & Johnston, 2013; Kovács-Hostyánszki et al., 2017; Cole et al., 2020) and the assessment of the effectiveness of measures that can be implemented in agricultural landscapes concerning the increase of abundance and diversity of wild pollinators (Eardley et al., 2016; Kovács-Hostyánszki et al., 2017; Krimmer et al., 2019; Cole et al., 2020).

Furthermore, scientific research aims to assess the motivation and barriers of farmers to implement such measures, however, always focused on biodiversity enhancing measures in general (Herzon & Mikk, 2007; Defrancesco et al., 2008; Villanueva et al., 2015), and not focused pollinator protection measures. However, a more specific focus on pollinators or insects is needed since they are experiencing the most severe decline (Sánchez-Bayo & Wyckhuys, 2019) and they are essential for the stability of ecosystems around the globe (Sánchez-Bayo & Wyckhuys, 2019; Thomas et al., 2004). The actions and measures needed to protect pollinators in agricultural landscapes are well studied and well known (Gemmill-Herren et al., 2021), however, even though this knowledge exists, large-scale uptake by farmers is difficult to secure. Hence, there is a need to assess what motivational reasons farmers have to

implement such measures on their farmers in order to adapt policy and thus increase uptake (Gemmill-Herren et al., 2021; Velten et al., 2018; Niens and Marggraf, 2010; Meyer et al., 2015).

Therefore, this research adds to the existing social-scientific body of literature through an assessment of which initiatives and what mode of governance is considered to be effective for the uptake of pollinator enhancing measures by farmers. Additionally, it focusses specifically on the motivation of farmers to participate in wild pollinator protection measures and thus shows that some motivational reasons and barriers might need to be weighted more strongly.

Furthermore, a general call for better governance to manage biodiversity in agricultural landscapes is increasing (IPBES, 2016; Leventon et al., 2019). Currently there is too much reliance on the CAP, even though it was established that it is unlikely that it will deliver meaningful benefits for biodiversity (Pe'er et al., 2014; Leventon et al., 2019). Good or better governance here is used to describe a state in which farmers participation in pollinator protection initiatives is high and through the collaboration of state, market and civil society actors, ideally, the negative wild pollinator trend can be reversed. However, they do not assess current policies. An assessment of current governance arrangements however seems to be essential to understand what is currently effective, what is not and how effectiveness and thus governance can or should be enhanced. This research, therefore, aimed to give insights on the identification of the three most relevant wild pollinator protection initiatives in Germany and England and evaluate their effectiveness based on the uptake of farmers. Based on that, lessons learned could be assessed. Therefore, this research can be used as a collection of first ideas for policy transfer and policy adaptations.

The ‘Mode of Governance’ framework by Driessen et al. (2012) was helpful for this research because it allowed for explicit and clear description of the complex governance arrangement around the wild pollinator protection discourse. As shown in this research, for the pollinator case, it appears that the central mode of governance is the most effective but the degree of effectiveness concerning the uptake by farmers is still not very high. Thus, considerations for alternative governance approaches for biodiversity measures or in this case wild pollinators in agricultural landscapes should be considered. One example could be by blending different governance approaches together which is not considered in the ‘Mode of Governance’ framework by Driessen et al. (2012). The problem with current governance approaches is that, as identified specifically in the Germany case, that farmers, do not appreciate

and accept top-down approaches and thus the uptake especially of voluntary measures is low (Velten et al., 2018). On the other side, bottom-up approaches are usually favored by farmers, as also shown in this research. However Velten et al. (2018) established that those initiatives often have challenges in communication, collaboration and coordination and thus the effects on biodiversity (i.e. in environmental terms) are often less significant (Leventon et al., 2019). Thus, a hybrid approach could be a possible solution which could be discussed in future research to use each approaches strength and avoid the weaknesses. However, it is also always important to consider, that biodiversity is not the only issue that needs to be tackled. Thus there needs to be a complementary between the system focused on the governance of biodiversity and the system for other issues such was groundwater pollution (Leventon et al., 2019). However, such changes might be very difficult to achieve because governance systems appear to be very resistant to change (Jordan, Wurzel, & Zito, 2003).

In any case, the results of this research show that it is essential for large-scale uptake of wild pollinator protection measures that farmers opinions, needs and suggestions are included in the creation of initiatives. Thus, it is essential for effective policy and to increase the uptake by farmers, that policy formulation must move beyond the focus on pollinator protection and be more holistic by including all stakeholders in the creation (Gemmill-Herren et al., 2021).

This research showed that the main motivation for farmers to participate in pollinator protection is the lousy opinion of civil society about the impacts traditional farming has on biodiversity and the perspective of monetary rewards. Research by Velten et al. (2018) and Lastra-Bravo et al. (2015) supported the results of needing financial incentives. However Velten et al. (2018) research also suggests, that the most important reason for farmers to implement biodiversity enhancing measures in general increases with improved communication and a collaboration between farmers. This reasons was not mentioned by farmers in this thesis research. Other research on biodiversity enhancing measures in general have also found, that the opinion of civil society and neighboring farmers do have an influence on the motivation to participate (Herzon & Mikk, 2007; Defrancesco et al., 2008; Villanueva et al., 2015; Joormann& Schmidt, 2017).

Furthermore, the most common barriers identified in this research to participate in pollinator protection measures have been stated to be time and money. Other scientific research focused on biodiversity in general neglects the time aspect but focuses on explaining a lack of motivation based on the fear of harsh rules, high sanctions, and high bureaucracy, especially in

Germany (Joormann & Schmidt) which was also mentioned by farmers in this research but was not considered the greatest barrier.

Kovács-Hostyánszki et al. (2017) further identified that costs concerning the implementation and maintenance are too high. They, therefore, mention that communication between farmers, policymakers, and scientists has to increase, and the farmers' insights have to be incorporated in decision-making processes and new policies (Kovács-Hostyánszki et al., 2017; Tarakini, Chemura & Musundire, 2020). A lack of communication between those actors has also not been established in the case of pollinators. Farmers mention that a general consultant would be needed to make informed decisions, however, it was not considered a general barrier. To assess effectiveness properly, thus the proposed conditions by Runhaar et al. (2017) should be weighted differently, because if the farmers are not motivated or able to participate the initiative cannot be considered effective since the uptake will stay low.

Moreover, for the specific case of wild pollinator governance, it was established that the landscape context needs to be taken into consideration when trying to create initiatives that should be effective in the uptake by farmers and effective to restore the abundance and diversity of wild pollinators. This conclusion is supported by research of Dollacker et al. (2021) who emphasizes that similar landscapes should be grouped together to enhance biodiversity.

Additionally, the results of this thesis show, that current initiatives mostly focus on targeting individual farmers to implement pollinator protection measures, however, it got clear that especially in the case for wild pollinators focusing on farmer collaborations or farmer clusters is essential, which is also supported by Leventon et al. (2019). They also suggest a focus on clustering farmers on similar landscapes. Landscape-scale management is increasingly discussed in literature especially in context of biodiversity protection (Tscharntke et al., 2005; Velten et al., 2018).

The landscape approach is especially interesting for wild pollinators because the pollination service depends on multiple intrinsic features of the crop itself but also about the habitat context and the neighboring vegetation. Thus, pollinator management should be based on content information especially connected to the landscape context (Gemmill-Herren et al., 2021).

5.1.2 Methodological Limitations

In this research four methodological limitations were identified. Firstly, by using Driessen et al.'s (2012) framework, a focus on ideal-typical arrangements was established.

Therefore, any initiatives that have been found were excluded if they did not fit into one of the modes. In England all initiatives fit in the modes, however, in Germany three initiatives did not fit properly, they all had a market actor as the main initiator. However, in this research, the most prevailing initiatives were identified and backed up by expert opinions to justify this selection and make sure that no main initiatives were missing.

Furthermore, by focusing on countries and not regions, possibly smaller-scale, regional or local initiatives have not been detected (i.e. initiatives with their own characteristics or initiatives that only act on a local level and thus might be more effective if they consider landscape contexts of the area). Those small-scale initiatives, perhaps would not have been relevant for this analysis for the uptake by farmers because they have a smaller scope. However, it could have been interesting to assess with what goals and policy instruments they are working and what farmers motivated to participate in them.

Secondly, before the interviews no specific types of farmers were preselected (i.e., farm size, farming style (dairy or crop production)). There was also no preselection based on whether they are dependent on insect-pollination. However, during the interviews, it became clear that the farming style, and thus the dependence on pollinators, might change farmers' perspectives on which measures for wild pollinators to implement along with their motivation to do so and resulting participation. However, this research did establish a connection between farming style and motivation to participate, which can be further analyzed in future research. Additionally, the timing of the farmer interviews (between April and June) was not ideal. Before the interviews, it was not considered that this would be the busiest time for farmers, and thus it was difficult to find farmers who were available for interviews. Therefore, only seven farmers could be interviewed. This number is not sufficient to generalize the findings to a whole country. However, since the motives and barriers were similar across the interviewed farmers, a general conclusion could be created. Additionally, Covid19 made it impossible to visit farms in person. This is unfortunate because farmers could only explain theoretically what measure they are implementing and how they are connected. With personal visits, a potential relationship could have been built up. It would have also been easier to read the farmers' emotions and better understand their measures and connectedness. Moreover, it would have been easier to understand where their problems and sorrows lie, especially concerning in-field measures and why some measures work or do not work.

Thirdly, the policy transfer section is very hypothetical. Usually, many factors have to be included, and policy transfer is a slow process, and mostly complete initiatives are not being transferred (Dolowitz & Marsh, 1996). In reality, policy makers often copy aspects of an initiatives or create hybrids (Nutley et al., 2012). Furthermore, this research focused on transferring the most effective initiative from one political set to the other, however, “policy making in a political context is not just about finding the most effective solution to a policy problem; it crucially involves finding solutions which fit particular political ideologies and which are seen to be innovative as well as effective” (Carroll & Common, 2013, p.43). Therefore the analysis done is not in-depth enough to assess whether an actual policy transfer is possible but focused more on the lessons that could be drawn from either country.

Lastly, the IA can only partly considered to be valid. The results are subjective and shaped by farmers opinions and experiences. All farmers interviewed already participated in some kind of initiatives and thus had measures in place. Therefore, their answers might have been biased based on their experiences and thus cannot be generalized to farmers who do not have any measures in place. Secondly, by mainly focusing on the four conditions that Runhaar et al. (2017) proposed, it was not considered whether one condition might be more important than others for the uptake of the initiatives by farmers. In the research it got clear that the motivation of farmers or the lack therefore and the ability of them to participate is essential and considered more important than the other conditions. Legitimization and demand might be a barrier to effectiveness but it can be substituted with some other benefit and thus might hinder the uptake but does not necessarily have to. However, if farmers are not motivated or able to participate there will be no uptake. Thus, the conditions should have been weighted differently to assess the actual effectiveness i.e. uptake by farmers.

5.1.3 Future Research

Future research could firstly address this research’s conclusion that there are different motivational reasons to participate in wild pollinator protection initiatives depending on farming styles/types. Perhaps, a survey could be utilized to reach more farmers and assess whether the size, style and type of farming influence their motivation.

Secondly, because the policy transfer analysis was highly hypothetical, more in-depth research could be undertaken. Ideally, similar research could be done in multiple countries with more similar geographical, socio-economic, and cultural characteristics. After the identification

of the most effective initiatives, the goals and policy instruments could be transferred, and the successfulness of this transfer could be assessed..

Additionally, future research connecting the perceived effectiveness (i.e. the social-scientific perspective) and the ecological effectiveness should be done. Furthermore, in future research, a similar impact assessment could be conducted with a stronger emphasis on the motivation of farmers, where, for example, the score of motivation of farmers is weighted more. The motivational conditions and the ability from Runhaar et al.'s (2017) framework appears to be more important for the uptake of wild pollinator initiatives, especially if they are voluntary.

Moreover, in this research, only farmers with wild pollinator protection measures in place have been interviewed. To adapt current policy, it would also be essential to understand the reasons why farmer's currently do not participate in such protection initiatives.

However it has to be noted that the reasons for a lack of success in the uptake of the initiatives, as established in this research, so as the effectiveness concerning most measures to conserve pollinators in agricultural landscapes might be that all governance arrangements are based on the idea of economic growth (IPBES 2019; Otero et al., 2020). Some research indicate that it is time to move away from the current growth paradigm and especially for biodiversity related topics it might be interesting to set specific targets first and then assess how different economic scenarios would accomplish them (van den Bergh, 2017; Otero et al., 2020). However, this topic would need a whole new research to assess if and how this would change the currently low uptake of pollinator protection initiatives.

5.2 Conclusion

In the conclusion, a summary of the answers to the three research questions will be given and recommendations concerning the governance of wild pollinator protection will be provided. Additionally a take-home message for policy makers will conclude this chapter.

5.2.1 RQ1: How, by whom and with what objectives is wild pollinator conservation in agricultural landscapes governed in Germany and England?

In this analysis, 20 initiatives in Germany and 11 initiatives in England were analyzed by desk research and expert interviews in each country. Of those initiatives, only three per country were considered relevant. The analysis revealed, that Germany is centrally governed where state actors incentivize most of the wild pollinator initiatives (11 initiatives out of 20). Furthermore, it became clear that Germany handles pollinator decline in a less structured way because it appears to be on the agenda of multiple ministries. The BMU (the federal ministry for Environment, Nature Conservation and Nuclear Safety), BfN (the Federal Agency for Nature Conservation) and the BMEL (The Federal Ministry of Food and Agriculture) are the main actors concerning wild pollinator conservation. Thus, there is confusion among farmers due to the lack of a unified pollinator strategy and there not being a singular ministry to contact.

The goals of the three identified German initiatives appeared to be very similar and focused on habitat creation and protection along with knowledge creation for farmers on how to protect wild pollinators on their fields and farms. The policy instruments used for mandatory initiatives most commonly are considered to be stricter and more demanding with the requirements of field visits, regular reports and also fines. Other, often voluntary measures, focus on rewarding farmers with price money and content creation such as short movies or certification logos for marketing purposes.

England on the other hand, did not show a prevailing mode of governance. Most initiatives aim to work together with all involved stakeholders and take farmers abilities and goals into consideration. Additionally, England appeared to be more organized, with only the Defra (Department for Food and Rural Affairs) as the main actor, which is involved not only in centrally governed initiatives but also in interactively governed and public-privately governed initiatives. England furthermore has a national pollinator strategy and a UK-wide pollinator scheme to detect which species are in decline in which areas. This seems to be essential for implementing measures that support threatened pollinators in specific areas. The goals of the relevant initiatives in England are similar to those in Germany in terms of their focus on habitat

creation, but they additionally focus on habitat connection to increase the resilience of pollinators to climate change. Moreover, the initiatives mainly emphasize voluntary participation, although they are often connected to mandatory measures. Their main policy instruments for mandatory measures are field visits and fines, while instruments for voluntary measures are often focused on educational exchange and inspiring other farmers to implement measures as well.

In conclusion, wild pollinator protection in Germany is centrally governed, with multiple ministries focused on habitat creation in agricultural landscapes. In England, no mode of governance was seen as prevailing, however most initiatives aim to include all stakeholders via coordination by the governmental department Defra that similarly focuses on habitat creation but also habitat connection for wild pollinators.

5.2.2 RQ2: How effective are governance arrangements in those countries and what motivates farmers to adapt their practices to participate?

To answer RQ2 six most relevant initiatives in Germany and in England were analyzed, concerning their effectiveness for farmer uptake and to assess what motivates farmers to participate in wild pollinator protection initiatives. The analysis was divided in assessing objectives of the initiatives including the amount of farmers that were targeted (*scope*) and how ambitious those targets are (*quality*). Additionally it was analyzed how *motivated* farmers are to participate, how *demanding* they are to participate, if there are special skills needed to do so (*ability*) and if farmers are *legitimized* to participate in wild pollinator protection initiatives.

This analysis revealed that in both countries, Germany and England, the centrally governed initiatives scored the highest on the overall impact assessment and thus are considered the most effective (see Figure 20). However, the scope of the centrally governed initiatives in both countries was lower than for other initiatives. Centralized initiatives have shown to target farmers more narrowly i.e. not taking farmer clusters or collaborations into consideration, compared to other types of governance who target all farmers inclusively.

In Germany, the overall effectiveness for centrally governed initiatives is the highest compared to other modes of governance. However, the initiatives were not able to achieve a full score because the motivation of farmers to participate was low. Farming practices have been an object of legislations for years and farmers are frustrated with the way in which the government is treating them. The government has been perceived negatively by farmers due to

a lack of inclusive decision making, villainization of farmers by policymakers in biodiversity discourses, and strict policies with overburdensome regulations with accompanying fines. Thus, German farmers consider top-down initiatives demanding and unfavorable, hence, their motivation to participate is low and therefore the uptake is low as well.

In England, the centrally governed initiatives were also assessed as the most effective. Farmers motivation was considered to be high due to the attractive financial benefits. However, the ability of farmers to participate in centrally governed initiatives was considered to be only moderate-low. The initiatives often have minimum requirements for farmers to participate which mostly focus on the size of the fields and thus small-scale farmers are excluded.

Additionally, the assessment revealed that the main *motivation* of farmers in both countries to participate in wild pollinator protection initiatives is societal pressure, like the growingly poor public opinion about traditional farmers. Additionally, financial rewards or compensation for the implementation of measures or resulting yield losses is a motivation for farmers in both countries. Thus, a monetary reward or compensation should be made available for farmers to increase the uptake in initiatives and thus their effectiveness.

The main *barriers* of farmers to participate in such initiatives were also similar across both countries. Most farmers listed time, money, and no benefits as the main reasons not to participate, which corresponds to the barriers identified in literature. Additionally, their motivation for mandatory measures is lower than it is for voluntary ones.

Based on these results, one can say that the mode of governance indeed does influence the effectiveness of initiatives and that there is no automatically effective mode of governance or initiative for wild pollinator protection yet. Especially for voluntary initiatives, the current barriers in the centrally governed initiatives are motivation and ability. These bottlenecks are especially detrimental for voluntary initiatives in regards to their uptake. If farmers cannot or are not willing to participate, the initiative cannot be considered effective. Germany will particularly have to work on counteracting the negative perception of top-down approaches to enhance the effectiveness of current and new initiatives perhaps based on lessons learned from other countries.

In conclusion, centrally governed wild pollinator protection initiatives seem to be the most effective. However, in the ranking of the IA there is still room for improvement. Currently,

the implemented measures do not appear to be successful enough in farmer uptake to counteract the decline of pollinators in either country and thus uptake enhancing measures should be taken. In Germany, the motivation of farmers especially affects the initiatives effectiveness because there is a negative perception of governmentally incentivized governance arrangements. While in England, the ability of farmers to participate decreases its effectiveness because it excludes small-scale farmers.

In general, the motivation of farmers in both countries to participate in wild pollinator protection initiative is the negative opinion of civil society and monetary rewards. The main barriers however are that farmers do not have the time, money and sufficient resulting benefits for their participation.

5.2.3 RQ3: Can the most effective mode of governance work in the other country and are there lessons that can be learned and transferred?

In the third research question, a combination of desk research and the evaluation of the results and RQ2 assessed if there are lessons that can be learned and if a policy transfer is possible between England and Germany.

This research showed that there are lessons that can be learned from either country and for the wild pollinator governance in general.

Lessons specifically for pollinator governance show that it is important for initiatives to not only to create measures focused on individual farmers for habitat creation, but that it is equally important to connect those habitats. Thus, policies should also consider farmer clusters and farmer collaborations in their scope to encourage habitat connection to effectively increase wild pollinator abundance and diversity.

Secondly, initiatives have to consider the landscape contexts of farmers, as some measures work better on one type of soil versus others. Additionally, not all threatened wild pollinators are threatened in all regions. Hence, in the creation of effective measures for threatened pollinators, measures should be created based on the pollinators' needs in specific areas. Farmers should be educated on such special measures and should be able to receive a benefit, ideally monetary, for implementing these specialized measures in addition to generic approaches.

Lastly, it appears to be important to consider farmers farming type (i.e. whether they are dairy farmers or cereal farmers). Farmers with different farming styles might have different motivational reasons to participate in wild pollinator protection initiatives. Furthermore,

farmers who are not dependent on pollination, like dairy farmers, might be less inclined to implement measures. Thus, benefits for farmers should ideally always been given to increase motivation and to counterbalance potential yield losses.

Specifically for Germany, it can be learned that a centrally governed approach might be theoretically effective because it often includes mandatory measures and harsher policy instruments, such as field visits and fines. However, when considering voluntary initiatives, farmers' motivation is essential for their uptake. However, since the motivation to participate is low, the current German strategy does not appear to be satisfactory and thus either a change in farmers perspective about top-down approaches is needed or the initiatives should move to a more interactive approach, focusing on the inclusion of all actors' motivations, needs and benefits. Thus, it is important to counteract these negative perceptions of environmental policies, regardless of how slow such a process would be. An initial step to counteract these negative perceptions can be the reduction in bureaucracy for the centrally-governed mandatory initiatives. Furthermore the rules for participation, especially in voluntary initiatives should also be less strict with room for farmers to develop and adapt measures to their form of farming and local context. Additionally, rewards should be given to increase the motivation of farmers. These measures as well as the inclusion of farmers in the creation of new initiatives might change perceptions of environmental policies with time, which would be essential for wild pollinator governance and the uptake of initiatives in agricultural landscapes.

In England, on the other hand, a more interactive approach that included all stakeholders, was found. Farmers perceived this approach positively because they were more often asked about their opinions for policy making. Interactively governed initiatives also appeared more effective concerning their scopes. However, the overall assessment showed that the perceived effectiveness is the greatest for centrally governed initiatives in England as well. This is based on the initiatives quality, particularly the motivation of farmers to participate, which was mostly connected to sufficient monetary rewards which allowed farmers to discount commonly referenced barriers to uptake like bureaucracy.

Additionally, farmers showed interest in participating in initiatives with a mandatory frameworks that have clear but not overly strict rules. However, they showed most interest to participate if they were able to adjust the measures based on their respective farming styles. Thus, the approach of including farmers in the decision-making process and having clear but flexible guidelines seems most effective in England for farmer uptake.

A complete transfer of the most effective centrally governed governance arrangement ‘Countryside Stewardship Scheme’ from England to Germany seems interesting, because it received the highest score for farmers motivation and because its centrally governed character matches the prevailing mode of governance in Germany. However, this transfer appears to be impossible due to German farmers’ the negative opinions about governmental bodies. Thus the voluntary uptake of this scheme could be less than in England.

In conclusion, this research showed that there is not one initiative or one mode of governance which can be considered the holy grail. All stakeholders should be involved in creating initiatives, while landscape contexts, farming styles, and particularly threatened pollinators should be considered carefully.

Ideally, a regulatory framework should be in place not only in some countries, but on an European-wide scale because pollinators do not know borders. Within this framework, there should be measures farmers can choose from based on their own goals, farming style, and landscape contexts. Additionally, there should always be a benefit for farmers who institute more than just mandatory measures. Furthermore, benefits should be given if farmers implement measures that target the most threatened pollinators in their areas.

Moreover, regional and local approaches should also be analyzed and taken into consideration because they often target more specific areas, and therefore, properly account for landscape contexts.

Thus, a systemic approach is needed to increase the effectiveness and hence the uptake of wild pollinator protection initiatives. To increase the uptake, central actors should focus on creating initiatives *with* farmers, and including their farming style, landscape-context, needs, ideas and benefits instead of creating measures *for* them.

6 Bibliography

- Aizen, M. A., Aguiar, S., Biesmeijer, J. C., Garibaldi, L. A., Inouye, D. W., Jung, C., ... & Seymour, C. L. (2019). Global agricultural productivity is threatened by increasing pollinator dependence without a parallel increase in crop diversification. *Global change biology*, 25(10), 3516-3527.
- Antin, T. M., Constantine, N. A., & Hunt, G. (2015). Conflicting discourses in qualitative research: The search for divergent data within cases. *Field Methods*, 27(3), 211-222.
- Ambrose-Oji, B., Buijs, A., Geróházi, E., Mattijssen, T., Száraz, L., van der Jagt, A. P. N., ... & Rolf, W. (2017). Innovative governance for urban green infrastructure: A guide for practitioners. Work Package 6: Innovative Governance for Urban Green Infrastructure Planning and Implementation *GREEN SURGE*.
- Anderson, C. (2010). Presenting and evaluating qualitative research. *American journal of pharmaceutical education*, 74(8).
- Arts, J., Runhaar, H. A., Fischer, T. B., Jha-Thakur, U., Laerhoven, F. V., Driessen, P. P., & Onyango, V. (2016). The effectiveness of EIA as an instrument for environmental governance: reflecting on 25 years of EIA practice in the Netherlands and the UK. *Environmental Assessment Policy, and Management Theory and Practice*, 171-210.
- Beebetter (n.d.). Die Initiative. <https://www.beebetter.de/die-initiative-was-ist-beebetter> (last accessed on 19th of April 2021).
- Beebetter (n.d.a). Kategorie: Landwirtschaft. <https://www.beebetter.de/kategorie-landwirtschaft> (last accessed on 19th of April 2021).
- Beebetter (n.d.b). Der Award: Bienen helfen und gewinnen. <https://www.beebetter.de/der-beebetter-award> (last accessed on 19th of April 2021).
- Benson, D., & Jordan, A. (2011). What have we learned from policy transfer research? Dolowitz and Marsh revisited. *Political studies review*, 9(3), 366-378.
- Bergman, M. M., & Coxon, A. P. (2005). The quality in qualitative methods. *Qualitative social research*, 6(2).
- BfN (n.d.). About BfN. <https://www.bfn.de/en/about-us.html> (last accessed on 15th of April 2021).
- Biesmeijer, J. C., Roberts, S. P., Reemer, M., Ohlemüller, R., Edwards, M., Peeters, T., ... & Kunin, W. E. (2006). Parallel declines in pollinators and insect-pollinated plants in Britain and the Netherlands. *Science*, 313(5785), 351-354.
- BMEL (2020). Understanding Farming: Facts and Figures about German Farming. https://www.bmel.de/SharedDocs/Downloads/EN/Publications/UnderstandingFarming.pdf;jsessionid=35A00222C1E758DB369830752EC1E0A0.live842?_blob=publicationFile&v=7 (last accessed on 11th of May 2021).

- BMEL (2020a). Land. Vielfalt. Leben: Bundeswettbewerb Insektenfreundliche Landwirtschaft. <https://www.bmel.de/DE/themen/landwirtschaft/artenvielfalt/bundeswettbewerb-land-vielfalt-leben.html> (last accessed on 18th of April 2021).
- BMEL (2020b). Flyer: Bundeswettbewerb Insektenfreundliche Landwirtschaft. https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/Flyer-Poster/flyer-wettbewerb-land-vielfalt-leben.pdf?__blob=publicationFile&v=4 (last accessed on 18th of April 2021).
- BMEL (n.d.). Landwirtschaft. <https://www.bmel-statistik.de/landwirtschaft/> (last accessed on 11th of May 2021).
- BMEL (n.d.a). Ministry. https://www.bmel.de/EN/ministry/ministry_node.html (last accessed on 15th of April 2021).
- BMEL (n.d.b). Biodiversity Protecting Bees and Insects. <https://www.bmel.de/EN/topics/farming/species-diversity/biodiversity-protecting-bees-insects.html> (last accessed on 15th of April 2021).
- BMU (2019). The German governments Environmental Report 2019. https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Umweltinformation/umweltbericht_2019_en_bf.pdf (last accessed on 5th of May 2021).
- BMU (2019a). The Ministry: Tasks and Structure. <https://www.bmu.de/en/ministry/tasks-and-structure/> (last accessed on 15th of April 2021).
- BMU (2019b). Action Program for Insect Conservation: Effective joint action against insect declines. https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/aktionsprogramm_insektenschutz_en.pdf (last accessed on 5th of May 2021).
- Buglife (n.d.). Our Work. <https://www.buglife.org.uk/our-work/> (last accessed on 10th of May 2021).
- Buglife (n.d.a). B-lines. <https://www.buglife.org.uk/our-work/b-lines/> (last accessed on 10th of May 2021).
- Burton, R.J.F. & Schwarz, G. (2013) Result-oriented agri-environmental schemes in Europe and their potential for promoting behavioural change. *Land Use Policy*, 30, 628–641.
- Carroll, P., & Common, R. (Eds.). (2013). Policy transfer and learning in public policy and management: International contexts, content and development. *Routledge*.
- Cavaco, A. M., Dias, J. S., & Bates, I. P. (2005). Consumers' perceptions of community pharmacy in Portugal: a qualitative exploratory study. *Pharmacy World and Science*, 27(1), 54-60.
- CBD (2018). Relevant Initiatives and Activities to Promote the Conservation and Sustainable Use of Pollinators. <https://www.cbd.int/doc/c/622d/8329/a7bf400210c794be8c69f366/sbstta-22-inf-19-en.pdf> (last accessed on 6th of May 2021).
- Chan, F. K. S., Chuah, C. J., Ziegler, A. D., Dąbrowski, M., & Varis, O. (2018). Towards resilient flood risk management for Asian coastal cities: Lessons learned from Hong Kong and Singapore. *Journal of Cleaner Production*, 187, 576-589.

- Christmann, S., Aw-Hassan, A., Rajabov, T., Khamraev, A. S., & Tsivelikas, A. (2017). Farming with alternative pollinators increases yields and incomes of cucumber and sour cherry. *Agronomy for Sustainable Development*, 37(4), 24.
- Cole, L. J., Kleijn, D., Dicks, L. V., Stout, J. C., Potts, S. G., Albrecht, M., ... & Biesmeijer, J. C. (2020). A critical analysis of the potential for EU Common Agricultural Policy measures to support wild pollinators on farmland. *Journal of Applied Ecology*, 57(4), 681-694.
- Dąbrowski, M., Musiałkowska, I., & Polverari, L. (2018). Introduction: drawing lessons from international policy-transfer initiatives in regional and urban development and spatial planning. *Regional Studies*, 52(9), 1165-1168.
- de Snoo, G. R., Herzon, I., Staats, H., Burton, R. J., Schindler, S., van Dijk, J., ... & Musters, C. J. M. (2013). Toward effective nature conservation on farmland: making farmers matter. *Conservation Letters*, 6(1), 66-72.
- Defra (2014). The National Pollinator Strategy: for bees and other pollinators in England. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794706/national-pollinator-strategy.pdf (last accessed on 5th of May 2021).
- Defra (2020). Farming Statistics – England. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/946241/structure-landuse-june20-eng-22dec20.pdf (last accessed on 5th of May 2021).
- Defra (2020a). Farming is Changing. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/939683/farming-changing.pdf (last accessed on 5th of May 2021).
- Defra (2021). Countryside Stewardship: Mid Tier and Wildlife Offers Manual. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920552/Countryside_Stewardship_Mid_Tier_2020_CS64_v1.0.pdf (last accessed on 10th of May 2021).
- Defra (n.d.). About Us. <https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/about> (last accessed on 8th of May 2021).
- Defrancesco, E., Gatto, P., Runge, F., & Trestini, S. (2008). Factors affecting farmers' participation in agri-environmental measures: A Northern Italian perspective. *Journal of agricultural economics*, 59(1), 114-131.
- Dennis, P., Fry, G. L. A., & Andersen, A. (2000). The impact of field boundary habitats on the diversity and abundance of natural enemies in cereals: Interchanges of insects between agricultural and surrounding landscapes. *Springer*, 195-214.
- Dollacker, A., Oppermann, R., de Graeff, R., & Haneklaus, S. (2021). Dually-beneficial habitats serve as a practical biodiversity mainstreaming tool in European crop production. *Journal für Kulturpflanzen*, 73(3), 53-71.

- Dolowitz, D. P., & Marsh, D. (2000). Learning from abroad: The role of policy transfer in contemporary policy-making. *Governance*, 13(1), 5-23.
- Dolowitz, D. P., & Marsh, D. (2012). The future of policy transfer research. *Political studies review*, 10(3), 339-345.
- Dolowitz, D., & Marsh, D. (1996). Who learns what from whom: a review of the policy transfer literature. *Political studies*, 44(2), 343-357.
- Downing, E., & Sutherland, N. (2017). Commons Library Debate Pack-The UK bee Population. *The House of Commons Library*.
- Driessen, P. P., Dieperink, C., van Laerhoven, F., Runhaar, H. A., & Vermeulen, W. J. (2012). Towards a conceptual framework for the study of shifts in modes of environmental governance—experiences from the Netherlands. *Environmental policy and governance*, 22(3), 143-160.
- Eardley, C., Freitas, B. M., Kevan, P. G., Rader, R., Gikungu, M., Klein, A. M., Maus, C., Meléndez Ramírez, V., Singh Palni, L. M., Vergara, C. H., and S. Wiantoro. 2016: Chapter 1 Background to pollinators, pollination and food production. In IPBES (2016): The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production. S.G. Potts, V. L. Imperatriz-Fonseca, and H. T. Ngo (eds). *Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, Bonn, Germany, 1-25.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.
- ESA (n.d.). About IPBES. <https://esa.org/ipbes/about/> (last accessed on 26th of July 2021).
- European Commission (2018). Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Pollinators Initiative <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52018DC0395> (last accessed on 1st of March 2021).
- European Commission (2020). United Kingdom – England: Political, Social and Economic Background and Trends. https://eacea.ec.europa.eu/national-policies/eurydice/content/political-social-and-economic-background-and-trends-93_en (last accessed on 9th of June 2021).
- European Commission (2020a). United Kingdom: Historical Development. https://eacea.ec.europa.eu/national-policies/eurydice/content/historical-development-93_en (last accessed on 9th of June 2021).
- European Commission (2021). Political, Social and Economic Background and Trends. https://eacea.ec.europa.eu/national-policies/eurydice/content/political-social-and-economic-background-and-trends-31_en (last accessed on 9th of June 2021).
- Evers, M., Stephan, E. (2021). Insektenschutzgesetz bringt Bauern und Agrarländer gegen Berlin auf. <https://rsw.beck.de/aktuell/daily/meldung/detail/insektenschutzgesetz-bringt-bauern-und-agrarlaender-gegen-berlin-auf> (last accessed on 17th of April 2021).

- Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002). Understanding and evaluating qualitative research. *Australian & New Zealand Journal of Psychiatry*, 36(6), 717-732.
- Franklin, E. L., & Raine, N. E. (2019). Moving beyond honeybee-centric pesticide risk assessments to protect all pollinators. *Nature ecology & evolution*, 3(10), 1373-1375.
- FSC (n.d.). UK Pollinator Monitoring Scheme (PMS). <https://www.fscbiodiversity.uk/blog/uk-pollinator-monitoring-scheme-poms> (last accessed on 8th of May 2021).
- Gaines-Day, H. R., & Gratton, C. (2017). Understanding barriers to participation in cost-share programs for pollinator conservation by Wisconsin (USA) Cranberry Growers. *Insects*, 8(3), 79.
- Gemmill-Herren, B., Garibaldi, L. A., Kremen, C., & Ngo, H. T. (2021). Building effective policies to conserve pollinators: translating knowledge into policy. *Current Opinion in Insect Science*.
- Geppert, C., Hass, A., Földesi, R., Donkó, B., Akter, A., Tschardtke, T., & Batáry, P. (2020). Agri-environment schemes enhance pollinator richness and abundance but bumblebee reproduction depends on field size. *Journal of Applied Ecology*, 57(9), 1818-1828.
- Greenstone, M., & Gayer, T. (2009). Quasi-experimental and experimental approaches to environmental economics. *Journal of Environmental Economics and Management*, 57(1), 21-44.
- Hallmann, C. A., Sorg, M., Jongejans, E., Siepel, H., Hofland, N., Schwan, H., ... & de Kroon, H. (2017). More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PloS one*, 12(10).
- Hamerow (2021). Germany. <https://www.britannica.com/place/Germany> (last accessed on 7th of June 2021).
- Herzon, I., & Mikk, M. (2007). Farmers' perceptions of biodiversity and their willingness to enhance it through agri-environment schemes: A comparative study from Estonia and Finland. *Journal for Nature Conservation*, 15(1), 10-25.
- Hevia, V., García-Llorente, M., Martínez-Sastre, R., Palomo, S., García, D., Miñarro, M., ... & González, J. A. (2020). Do farmers care about pollinators? A cross-site comparison of farmers' perceptions, knowledge, and management practices for pollinator-dependent crops. *International Journal of Agricultural Sustainability*, 1-15.
- Holzschuh, A., Dudenhöffer, J. H., & Tschardtke, T. (2012). Landscapes with wild bee habitats enhance pollination, fruit set and yield of sweet cherry. *Biological Conservation*, 153, 101-107.
- Holzschuh, A., Steffan-Dewenter, I., & Tschardtke, T. (2008). Agricultural landscapes with organic crops support higher pollinator diversity. *Oikos*, 117(3), 354-361.
- Hood, C. (2007). Public service management by numbers: Why does it vary? Where has it come from? What are the gaps and the puzzles?. *Public Money and Management*, 27(2), 95-102.

- Huge, J., Waas, T., Eggermont, G., & Verbruggen, A. (2011). Impact assessment for a sustainable energy future—Reflections and practical experiences. *Energy Policy*, 39(10), 6243-6253.
- IPBES (2016). The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production. S.G. Potts, V. L. Imperatriz-Fonseca, and H. T. Ngo (eds). *Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, Bonn, Germany.
- IPBES (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. *IPBES Secretariat*.
- James, O., & Lodge, M. (2003). The limitations of ‘policy transfer’ and ‘lesson drawing’ for public policy research. *Political studies review*, 1(2), 179-193.
- Joormann, I., & Schmidt, T. G. (2017). FRANZ-Studie—Hindernisse und Perspektiven für mehr Biodiversität in der Agrarlandschaft. *Thünen Institut*, 3-32.
- Jordan, A., Wurzel, R. K., & Zito, A. R. (2003). 'New' instruments of environmental governance: *Patterns and pathways of change*.
- Kellner, P., & Hartford, T., (2019). England. <https://www.britannica.com/place/England/Economy> (last accessed on 9th of June 2021).
- Kleijn, D., Baquero, R. A., Clough, Y., Diaz, M., De Esteban, J., Fernández, F., ... & Yela, J. L. (2006). Mixed biodiversity benefits of agri-environment schemes in five European countries. *Ecology letters*, 9(3), 243-254.
- Knill, C., (2005). Introduction: Cross-national policy convergence: concepts, approaches and explanatory factors. *Journal of European Public Policy*, 12 (5), 764-774.
- Kovács-Hostyánszki, A., Espíndola, A., Vanbergen, A. J., Settele, J., Kremen, C., & Dicks, L. V. (2017). Ecological intensification to mitigate impacts of conventional intensive land use on pollinators and pollination. *Ecology Letters*, 20(5), 673-689.
- Krimmer, E., Martin, E. A., Krauss, J., Holzschuh, A., & Steffan-Dewenter, I. (2019). Size, age and surrounding semi-natural habitats modulate the effectiveness of flower-rich agri-environment schemes to promote pollinator visitation in crop fields. *Agriculture, Ecosystems & Environment*, 284, 106590.
- Kroll, F. L. (2010). Kultur, Bildung und Wissenschaft im 20. Jahrhundert. *Oldenbourg Verlag*.
- Lange, P. (2015). Governing towards sustainability: the potential of different modes of governance. *University of Basel*, 1-21.
- Lange, P., Driessen, P. P., Sauer, A., Bornemann, B., & Burger, P. (2013). Governing towards sustainability—conceptualizing modes of governance. *Journal of environmental policy & planning*, 15(3), 403-425.

- Lastra-Bravo, X. B., Hubbard, C., Garrod, G., & Tolón-Becerra, A. (2015). What drives farmers' participation in EU agri-environmental schemes?: Results from a qualitative meta-analysis. *Environmental Science & Policy*, 54, 1-9.
- Lenschow, A., Liefferink, D., & Veenman, S. (2005). When the birds sing. A framework for analysing domestic factors behind policy convergence. *Journal of European public policy*, 12(5), 797-816.
- Leuzinger-Bohleber, M., & Fischmann, T. (2006). What is conceptual research in psychoanalysis? 1: Research Subcommittee for Conceptual Research of the International Psychoanalytical Association 3. *The International Journal of Psychoanalysis*, 87(5), 1355-1386.
- Leventon, J., Schaal, T., Velten, S., Loos, J., Fischer, J., & Newig, J. (2019). Landscape-scale biodiversity governance: Scenarios for reshaping spaces of governance. *Environmental Policy and Governance*, 29(3), 170-184.
- MacInnis, G., & Forrest, J. R. (2019). Pollination by wild bees yields larger strawberries than pollination by honey bees. *Journal of Applied Ecology*, 56(4), 824-832.
- Mackay, R., & Horton, D. (2003). Expanding the use of impact assessment and evaluation in agricultural research and development. *Agricultural systems*, 78(2), 143-165.
- Maderson, S., & Wynne-Jones, S. (2016). Beekeepers' knowledges and participation in pollinator conservation policy. *Journal of Rural Studies*, 45, 88-98.
- Mallinger, R. E., & Gratton, C. (2015). Species richness of wild bees, but not the use of managed honeybees, increases fruit set of a pollinator- dependent crop. *Journal of Applied Ecology*, 52, 323–330. <https://doi.org/10.1111/1365-2664.12377>.
- Marggraf, R. (2003). Comparative assessment of agri-environment programmes in federal states of Germany. *Agriculture, ecosystems & environment*, 98(1-3), 507-516.
- Mathison, S. (1988). Why triangulate?. *Educational researcher*, 17(2), 13-17.
- Merriam, S. B., & Tisdell, E. J. (2015). Qualitative research: A guide to design and implementation. *John Wiley & Sons*.
- Meyer, C., Reutter, M., Matzdorf, B., Sattler, C., & Schomers, S. (2015). Design rules for successful governmental payments for ecosystem services: Taking agri-environmental measures in Germany as an example. *Journal of Environmental Management*, 157, 146-159.
- Mupepele, A. C., Böhning-Gaese, K., Lakner, S., Plieninger, T., Schoof, N., & Klein, A. M. (2019). Insect conservation in agricultural landscapes: An outlook for policy-relevant research. *GAIA- Ecological Perspectives for Science and Society*, 28(4), 342-347.
- NAP (2021). Schutz von Bienen und anderen Bestäubern. <https://www.nap-pflanzenschutz.de/risikoreduzierung/schutz-von-umwelt-und-gesundheit/schutz-von-terrestrischen-organismen/schutz-von-bienen-und-anderen-bestaeufer/> (last accessed on 15th of April 2021).
- Neudorff (n.d.). #beebetter. <https://www.neudorff.de/service/ueber-neudorff/nachhaltigkeit-philosophie/soziales/projekte/beebetter.html> (last accessed on 19th of April 2021).

- Niens, C., & Marggraf, R. (2010). Recommendations for increasing the acceptance of agri-environmental schemes-results of an empirical study in Lower Saxony. *Berichte über Landwirtschaft*, 88(1), 5-36.
- Nooteboom, S. (2007). Impact assessment procedures for sustainable development: A complexity theory perspective. *Environmental Impact Assessment Review*, 27(7), 645-665.
- Nutley, S., Downe, J., Martin, S., & Grace, C. (2012). Policy transfer and convergence within the UK: the case of local government performance improvement regimes. *Policy & Politics*, 40(2), 193-209.
- Otero, I., Farrell, K. N., Pueyo, S., Kallis, G., Kehoe, L., Haberl, H., ... & Pe'Er, G. (2020). Biodiversity policy beyond economic growth. *Conservation letters*, 13(4), e12713.
- Peck, J., & Theodore, N. (2010). Mobilizing policy: Models, methods, and mutations. *Geoforum*, 41(2), 169-174.
- Pe'er, G., Dicks, L. V., Visconti, P., Arlettaz, R., Báldi, A., Benton, T. G., ... & Scott, A. V. (2014). EU agricultural reform fails on biodiversity. *Science*, 344(6188), 1090-1092.
- Persson, A. S., Rundlöf, M., Clough, Y., & Smith, H. G. (2015). Bumble bees show trait-dependent vulnerability to landscape simplification. *Biodiversity and Conservation*, 24(14), 3469-3489.
- Ponelis, S. R. (2015). Using interpretive qualitative case studies for exploratory research in doctoral studies: A case of Information Systems research in small and medium enterprises. *International Journal of Doctoral Studies*, 10(1), 535-550.
- Potts, S. G., Biesmeijer, J. C., Kremen, C., Neumann, P., Schweiger, O., & Kunin, W. E. (2010). Global pollinator declines: trends, impacts and drivers. *Trends in ecology & evolution*, 25(6), 345-353.
- Powney, G. D., Carvell, C., Edwards, M., Morris, R. K., Roy, H. E., Woodcock, B. A., & Isaac, N. J. (2019). Widespread losses of pollinating insects in Britain. *Nature communications*, 10(1), 1-6.
- Powney, G., Harrower, C., Outhwaite, C., & Isaac, N. (2020). England Biodiversity Indicators 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/925465/10_Pollinators_accessible.pdf (last accessed on 8th of May 2021).
- Promote Pollinators (n.d.). Germany. <https://promotepollinators.org/project/germany/> (last accessed on 18th of April 2021).
- Radaelli, C. M., & Pasquier, R. (2008). Conceptual issues in Europeanization. *Palgrave Macmillan*, 35-45.
- RHS (2021). Pollinators: Decline in Numbers. <https://www.rhs.org.uk/advice/profile?PID=528> (last accessed on 5th of May 2021).
- Robertson, D. B., & Waltman, J. L. (1992). The politics of policy borrowing. *Something Borrowed, Something Blue*, 311-330.

- Rose, R. (1991). What is lesson-drawing?. *Journal of public policy*, 3-30.
- Rosendal, G. K., & Andresen, S. (2011). Institutional design for improved forest governance through REDD: Lessons from the global environment facility. *Ecological Economics*, 70(11), 1908-1915.
- Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). Measuring and monitoring program outcomes. Evaluation: a systematic approach. *Thousand Oaks*, 7, 223-264.
- Rowley, J. (2002). Using case studies in research. *Management research news*.
- Runhaar, H., Dieperink, C., & Driessen, P. (2006). Policy analysis for sustainable development. *International Journal of Sustainability in Higher Education*.
- Runhaar, H. A. C., Melman, T. C., Boonstra, F. G., Erisman, J. W., Horlings, L. G., De Snoo, G. R., ... & Arts, B. J. M. (2017). Promoting nature conservation by Dutch farmers: a governance perspective. *International Journal of Agricultural Sustainability*, 15(3), 264-281.
- Sánchez-Bayo, F., & Wyckhuys, K. A. (2019). Worldwide decline of the entomofauna: A review of its drivers. *Biological conservation*, 232, 8-27.
- Shuler, R. E., Roulston, T. A. H., & Farris, G. E. (2005). Farming practices influence wild pollinator populations on squash and pumpkin. *Journal of economic entomology*, 98(3), 790-795.
- Stoner, K. A. (2016). Current pesticide risk assessment protocols do not adequately address differences between honey bees (*Apis mellifera*) and bumble bees (*Bombus* spp.). *Frontiers in Environmental Science*, 4, 79.
- Tarakini, G., Chemura, A., & Musundire, R. (2020). Farmers' knowledge and attitudes toward pollination and bees in a maize-producing region of Zimbabwe: Implications for pollinator conservation. *Tropical Conservation Science*, 13, 1-11.
- Thomas, C. D., Cameron, A., Green, R. E., Bakkenes, M., Beaumont, L. J., Collingham, Y. C., ... & Williams, S. E. (2004). Extinction risk from climate change. *Nature*, 427(6970), 145-148.
- Tirado, R., Simon, G., & Johnston, P. (2013). Bees in decline: A review of factors that put pollinators and agriculture in Europe at risk. *Greenpeace Research Laboratories Technical Report (Review)*, 1(2013), 1-48.
- Tscharntke, T., Klein, A. M., Kruess, A., Steffan-Dewenter, I., & Thies, C. (2005). Landscape perspectives on agricultural intensification and biodiversity–ecosystem service management. *Ecology letters*, 8(8), 857-874.
- UK Government (2021). Countryside Stewardship: Mid Tier and Wildlife Offers manual for agreements starting on 1 January 2022. <https://www.gov.uk/guidance/countryside-stewardship-mid-tier-and-wildlife-offers-manual-for-agreements-starting-on-1-january-2022/annex-4-applying-for-the-wild-pollinator-and-farm-wildlife-packages> (last accessed on 10th of May 2021).

- UK Government (n.d.). Countryside Stewardship. <https://www.gov.uk/government/collections/countryside-stewardship> (last accessed on 10th of May 2021).
- Underwood, E., Darwin, G. and Gerritsen, E. (2017) Pollinator initiatives in EU Member States: Success factors and gaps. Report for European Commission under contract for provision of technical support related to Target 2 of the EU Biodiversity Strategy to 2020 – maintaining and restoring ecosystems and their services ENV.B.2/SER/2016/0018. *Institute for European Environmental Policy*.
- Vanbergen, A., Heard, M., Breeze, T., Potts, S., & Hanley, N. (2014). A report to the Department for Environment, Food and Rural Affairs (Defra). <http://nora.nerc.ac.uk/id/eprint/505259/1/N505259CR.pdf> (last accessed on 5th of May 2021).
- van den Bergh, J. C. J. M. (2017). A third option for climate policy within potential limits to growth. *Nature Climate Change*, 7(2), 107–112. <https://doi.org/10.1038/nclimate3113>.
- Velten, S., Schaal, T., Leventon, J., Hanspach, J., Fischer, J., & Newig, J. (2018). Rethinking biodiversity governance in European agricultural landscapes: Acceptability of alternative governance scenarios. *Land Use Policy*, 77, 84-93.
- Vergara, C. H., Badano, E. I. (2009). Pollinator diversity increases fruit production in Mexican coffee plantations: The importance of rustic management systems. *Agriculture, Ecosystems & Environment*, 129, 117–123. <https://doi.org/10.1016/j.agee.2008.08.001>.
- Villanueva, A. J., Gómez-Limón, J. A., Arriaza, M., & Rodríguez-Entrena, M. (2015). The design of agri-environmental schemes: Farmers' preferences in southern Spain. *Land use policy*, 46, 142-154.
- Wilson, G.A. & Hart, K. (2001) Farmer participation in agri-environmental schemes: towards conservation-oriented thinking? *Sociologia Ruralis*, 41, 254–274.
- Wynne-Jones, S. (2013) Ecosystem service delivery in Wales: evaluating farmers' engagement and willingness to participate. *Journal of Environmental Policy & Planning*, 15, 493–511.

