Connecting data with CAP, Green Deal and other EC Frameworks & Policies

Lead partner: ENEA

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Technical References

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[1] PU = Public

PP = Restricted to other programme participants (including the Commission Services)

RE = Restricted to a group specified by the consortium (including the Commission Services)
CO = Confidential, only for members of the consortium (including the Commission Services)

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3	22-01-2024	ENEA	ENEA (Luciana Di Gregorio and Annamaria Bevivino)

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Summary

Task 1.2 main objective is to connect data with Common Agricultural Policy (CAP), Green Deal, and other EC legislative frameworks and policies, for ensuring awareness and relevance of Food Security (FS), Biodiversity (BD), and Climate change (CC) issues in the European policies. The task also aims to establish a dialogue with policy actors to incorporate their knowledge and needs into the data-policy link.

The present report examines, through a systematic approach, European policy documents on climate change, biodiversity, and food security, analysing gaps and connections with data in order to provide information and tools for a sustainable transition resilient to climate change and biodiversity loss. Additionally, the current report, based on the findings through dialogue with policymakers, aims at identifying topics that are progressing towards effective sustainability and those that still remain open.

Disclaimer

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List of acronyms and abbreviations

AI: Artificial Intelligence

ARG: Antibiotic Resistance Gene

AWC: Available Water Capacity

BD: Biodiversity

CAP: Common Agricultural Policy

CASH: Comprehensive Assessment of Soil Health

CC: Climate Change

CH_4: Methane

CO: Confidential, only for members of the consortium (including the Commission Services)

CO_2: Carbon Dioxide

CUT: Cyprus University of Technology

CZU: Czech University of Life Sciences Prague

EC: European Commission

ECHA: European Chemicals Agency

ECO-READY: Achieving Ecological Resilient Dynamism for the European food system through consumer-driven policies

EEA: European Environment Agency

EFCA: European Fisheries Control Agency

EFSA: European Food Safety Authority

ENEA: Italian National Agency for New Technologies, Energy and Sustainable Economic Development

ESDAC: European Soil Data Centre

EU: European Union

EUSO: European Union Soil Observatory

F2F: Farm To Fork

FAO: Food and Agriculture Organization

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FAO: Food and Agriculture Organization of the United Nations

FS: Food Security

GAEC: Good Agricultural and Environmental Conditions

GMO: Genetically Modified Organisms

IoT: Internet of Things

IPBES: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

JRC: Joint Research Centre

LC/LU: Land Cover/Land Use

LL~~s~~: Living Lab~~s~~

LUCAS: Land Use-Land Cover Area Frame Survey

N_2O: Nitrous Oxide

NGO: Non-Governmental Organization

NPKS: Nitrogen, Phosphorus, Potassium, and Sulfur

OM: Organic Matter

PP: Restricted to other programme participants (including the Commission Services)

PU: Public

RE: Restricted to a group specified by the consortium (including the Commission Services)

SDG: Sustainable Development Goal~~s~~

SPEI: Standardized Precipitation Evapotranspiration Index

SWI: Soil Water Index

UN: United Nations

WP~~s~~: Work Package~~s~~

WR: Wageningen Research

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1. Objective

ECO-READY is a European project with the primary objective of *achieving ecological resilient dynamism for the European food system* through consumer-driven policies, socio-ecological challenges, biodiversity considerations, data-driven policy, and sustainable futures. This project recognises the significant impact of climate change and biological factors on the food system, thereby influencing food security at both regional and European levels. In response to these challenges, the project aims to develop an Observatory platform, a real-time surveillance system that consolidates comprehensive information and data related to the role of climate change and biodiversity in shaping food security. The primary aim of the Observatory is to assess, monitor, and manage these critical impacts, facilitated by a network of 10 Living Labs (LLs). These LLs are designed to provide decision-makers with essential data, potential scenarios, and effective strategies. To achieve the project's goals, six Work Packages (WPs) have been formulated, each addressing specific aspects and further subdivided into distinct tasks. WP1 purpose is to understand the susceptibilities of the EU food system concerning climate change and other systemic shocks, such as pandemics or wars, and to grasp the complex repercussions of these evolving dynamics. The aim is to identify differences between the present conditions and the future status of food security, considering factors that may influence the resilience of food systems in specific pilot regions. The objective is to create at least 50 model-based scenarios (5 per LL) that will challenge the gaps in food system resilience, acting as an initial framework for testing by the LLs (WP3).

In the framework of WP1 of the ECO-READY project, the Task 1.2, 'Connecting data with CAP, Green Deal and other EC Frameworks & Policies', has two main aims: *i)* to ensure relevance to the European policies for Food Security (FS), Biodiversity (BD), Climate change (CC); *ii)*to establish a connection between data related to FS, BD, CC, and relevant European policies such as the CAP and the Green Deal. For the achievement of these two main aims, the identification of the most appropriate method(s) of knowledge synthesis to effectively link data and knowledge with policy requirements and expected outcomes has been required.

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Within the Task 1.2, another objective is to set up the conditions for a continuous dialogue with European policy actors representing different fields of expertise and competences, to feed their knowledge, views and needs into the data-policy link.

2. Background

In recent years, the European Union (EU) has taken significant developments towards addressing the pressing challenges posed by climate change, biodiversity loss, and ensuring food security. Policies such as the Green Deal, and some of its key strategies such as the Farm to Fork (F2F) strategy or the Biodiversity Strategy underscore the EU's commitment to a sustainable and resilient future. These policies reflect a shared vision towards sustainable development, acknowledging the complex links between climate, biodiversity, and the foundational elements of common well-being and food security. Central to this commitment is the Green Deal, an ambitious strategy that plans a carbon-neutral Europe by 2050[1]. By prioritising the reduction of greenhouse gas (GHG) emissions and promoting a circular economy, the Green Deal emphasises the need for systemic change in agriculture and food production. Embedded within the Green Deal is the F2F Strategy, an initiative that pursues transforming the entire food supply chain[2]. By encouraging reduced pesticide use, limited antibiotics, and a shift towards organic/sustainable practices, this strategy underscores the interconnection between environmental health and our ability to ensure safe nutrition.

Implicit in this approach is the need to comprehend how climate-induced alterations as well as biodiversity loss impact not only the production but also the quality and accessibility of food. The current Common Agricultural Policy includes some elements towards a more

[1] European Commission. (2019). Communication COM/2019/640 final: The European Green Deal. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640&qid=1690884927805

[2] European Commission. (2020). Communication COM/2020/381 final: A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381

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sustainable and environmentally friendly agricultural sector[3,4,5], the so called 'green architecture of the CAP'. For example, by incorporating 'eco-schemes' that reward farmers for adopting environmentally friendly practices, CAP recognizes the crucial role of biodiversity in maintaining resilient ecosystems. Studying the intricate connections between biodiversity, climate change, and agriculture is fundamental for creating effective policies that balance food production and preserving ecosystems for long-term agricultural resilience. Climate change and biodiversity loss are intrinsically linked and together pose a significant threat to global food security. Extreme weather events, shifts in crop growing seasons, and the loss of pollinators are just a few examples of how climate change may affect agriculture. Biodiversity, on the other hand, plays a vital role in maintaining resilient ecosystems that can adapt to changing conditions. Understanding this nexus is vital for formulating strategies that ensure food security in the face of a changing climate (Behnassi et al. 2022). Taking actions, in recent years, EU members emphasised the importance of preserving food supply security and endorsed short-term and medium-term measures at the state levels. These initiatives aim to protect food security and enhance the resilience of food systems, with many of them potentially implemented through the CAP. EU farmers have been supported with a 500 million € package provided by the EU Commission[6] to safeguard food security and enhance the resilience of food systems. The REPowerEU plans to take a central stage[7]. The new CAP strategic plans focus on reducing reliance on natural gas, fossil fuels, pesticides, and fertilisers. Furthermore, a distinctive and temporary exception allows the cultivation of any crops for food and feed on fallow land, with farmers retaining the full greening payment. To adapt to the evolving situation, specific temporary

[3] European Commission. (2021). Regulation (EU) 2021/2115: Establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG

[4] European Commission. (2021). Regulation (EU) 2021/2116: Financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG

[5] European Commission. (2021). Regulation (EU) 2021/2117: Establishing a common organisation of the markets in agricultural products, (EU) No 1151/2012 on quality schemes for agricultural products and foodstuffs, (EU) No 251/2014 on the definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the Union. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0262.01.ENG

[6] European Commission. (2016). Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/IP_16_2563

[7] European Commission. (2022). Communication COM/2022/230 final. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN

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exclusions from current animal feed import regulations have been introduced. These measures underscore the EU's commitment to address immediate challenges and to foster a resilient and secure food system. Constituted by four pillars, namely Availability, Access, Utilisation, and Stability, food security is a multidimensional concept. It is closely connected with the Sustainable Development Goals (SDGs) and considered a key element of them, particularly within Goal 2, which aims for zero hunger. The scientific literature raises concerns about these interrelationships, by suggesting the addition of further variables, particularly those associated with biodiversity and climate change. Furthermore, the strict relationships between food security and sustainability require a comprehensive multidisciplinary assessment. Determinants such as agricultural practices, alternative sources of food supply, and public policies play crucial roles in fostering more sustainable food security (Guiné et al. 2021) (Figure 1).

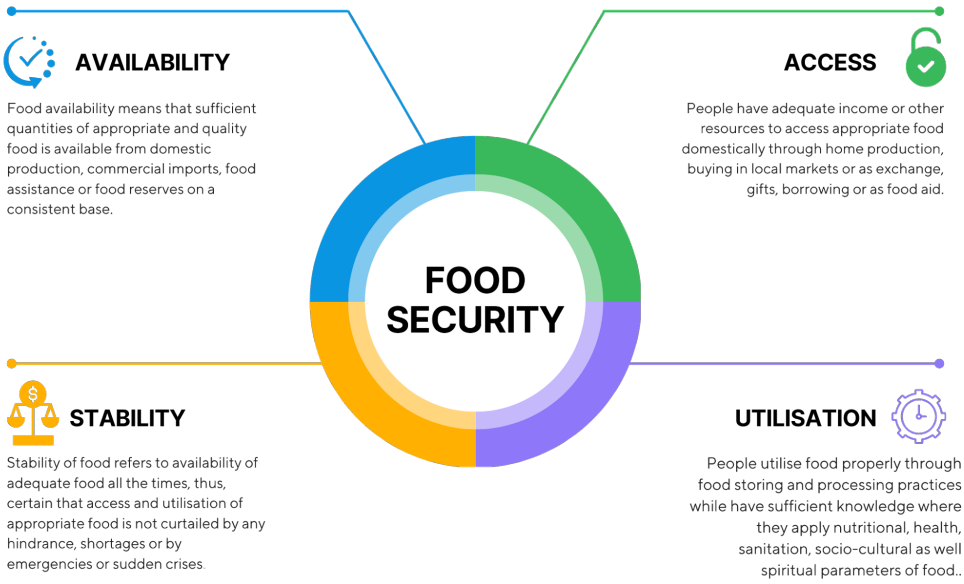

Figure 1: The four pillars of Food Security - Availability, Access, Stability, Utilization: key components ensuring ample, accessible, stable, and nutritious food for a secure and sustainable food system. Adapted from Gunaratne et al. Humanit Soc Sci Commun 8, 229 (2021) https://doi.org/10.1057/s41599-021-00917-4.

The decision-making process within the EU is a multi-stage and iterative process, which involves numerous actors, legal instruments, collaboration, transparency, and ongoing evaluation. EU legislation comprises primary elements such as the Treaties, and secondary components, including specific laws like Regulations, Directives and Decisions

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(https://european-union.europa.eu/institutions-law-budget/law/types-legislation_en).

The policy-making process typically begins with the publication of a legislative proposal by the European Commission (or amendments to existing laws), as a consequence of the identification of technical needs. After the proposal, legislative drafts are prepared, detailing the scope, objectives of the proposed policy. Then, the consultation process starts and includes inputs from a wide range of stakeholders, such as member states, businesses, non-governmental organisations (NGOs), and citizens. Impact assessments, if applicable, are also conducted to evaluate the potential effects of the proposed policy considering economic, social and environmental aspects. Debates and negotiations within the European Parliament Commissions concerned drive the approval process until the European Council, where the general approach is discussed by representatives of Member States. The consolidated version of the legislative proposal is further discussed via the last step of the Trilogue where EU Commission, EU Parliament and EU Council representatives need to negotiate a common position and to find an agreement on the final text of the legislative proposal. Once approved, the legislative act enters directly into the Member States legislations (in case of EU Regulation) or it needs to be transposed by a national law before entering in force (in case of Directive). Beyond this process each legislative act will be also subjected to an evaluation, in order to assess the impact and effectiveness of the policy, and the periodic review (evaluation of their performance, identification of any shortcomings) (Selin et al. 2015) (Figure 2).

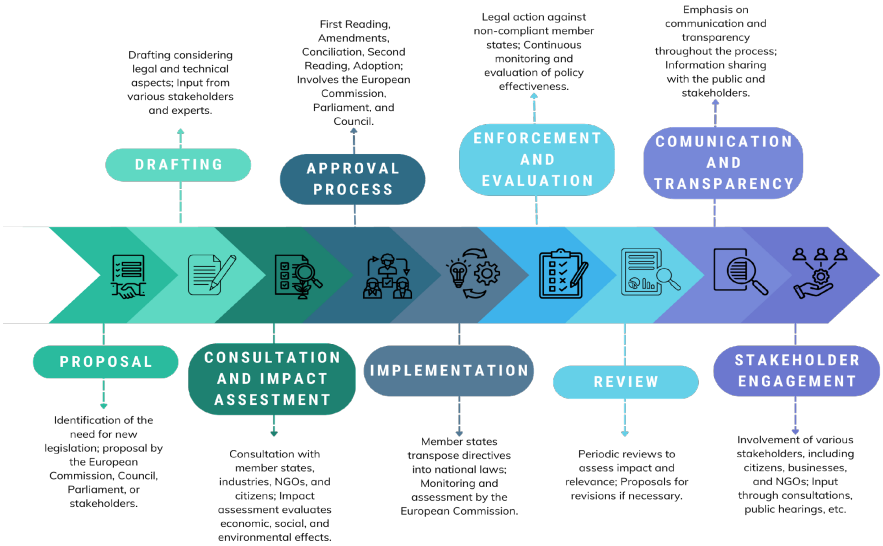

Figure 2: Policy Making Process overview. The diagram illustrates the policy-making steps, providing a view of the strategic phases involved.

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During this intricate process, the scientific community plays a central role, particularly in the context of policy documents related to the recent environmentally sustainable laws. The European Environment Agency (EEA), the European Food Safety Authority (EFSA), the European Chemicals Agency (ECHA), and the European Fisheries Control Agency (EFCA), scientists involved in EU projects are some of the entities and people involved, providing the scientific and technical information that guides decision-making, providing assessments, reports, technical insights, and recommendations. The contributions of the scientific community are indispensable for constructing evidence-based policies, and the expertise provided by these scientific bodies aids EU institutions and Member States in making well-informed decisions and in formulating Regulations grounded in scientific evidence. The role of the scientific community becomes increasingly important, especially when addressing legislation related to complex issues like food security. This implies technical assessments aimed at promoting resilience and the thorough analysis and adoption of sustainable solutions. In a world that is becoming more globalised, policymakers must recognize that food insecurity in one region could yield substantial political, economic, and environmental consequences elsewhere. Consequently, despite the actions of various global organisations like the Food and Agriculture Organization of the United Nations (FAO) and the United Nations (UN), the challenge of food insecurity is escalating. This escalation underscores the necessity for more efficacious and sustainable solutions to ensure the mitigation of food insecurity and the sustainability of food production. Implementing climate-friendly agricultural production methods provides a dual solution to the challenges of food security and climate change. This involves intensifying agricultural production while minimising environmental stress to ensure the sustainable long-term production of food. Although this *sustainable intensification* strategy is part of the policy agenda for numerous governments worldwide, it has faced criticism for its perceived emphasis on production or lack of coherence. In the twenty-first century, the primary mission is to establish a sustainable food system, challenging a more concrete policy framework than the currently existing one. Unfortunately, this mission has been impeded by competing solutions for policy focus and policies that have so far failed to integrate evidence from social, environmental, and economic components into a comprehensive and cohesive policy response. Climate change is forcing millions of people into a cycle of food insecurity and poverty. Nonetheless, addressing both food insecurity

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and climate change requires the urgent adoption of climate-friendly agricultural production methods (Wahbeh et al. 2022).

The present report, by examining the most important European policy documents on CC, BD, and FS, aims to ensure relevance of such Regulations, Directives, Legislative proposals, and Communications. It detects and analyses the gaps and connections with data to provide tools for improvement towards a sustainable transition resilient to climate change and biodiversity loss. Additionally, through a dialogue with European policy actors, a series of main conclusions proceeding from the discussion with them have been summarised. These outputs pinpoint topics that are progressing towards effective sustainability, and others that remain open.

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3. Methodology

The identification and analysis of the EU policies for the current study were performed by applying two Eklipse knowledge synthesis methods, namely the Method 5 'Expert Consultation' and the Method 19 'Systematic Map' (Eklipse report 2018). The 'Expert Consultation' Eklipse Method 5 involved a dialogue with a designated set of experts, either individually or in a group, to gather judgement, evaluations, or opinions. This was carried out through online consultations, in-person meetings, individual interviews, written consultations, as well as group meetings. The main source of the specialists in agri-food systems involved in the analysis of the relationships between data and policies has been the Eco-Ready Project Partnership. The Joint Research Center (JRC) provided access to datasets and all publicly available data in the JRC data catalogue, enhancing the ability to scrutinize and comprehend the intricate dynamics of the subject matter. The Confederation of Italian Farmers (CONFAGRICOLTURA), a key collective organization representing up to 34% of Italian farmers, actively participated in the process. They not only articulated the legitimate interests of Italian farmers but also provided a valuable list of policy documents sourced from their legal experts. The International Union for Conservation and Nature (IUCN), a global authority on the natural world, contributed expertise in conservation and sustainable development. The Italian National Agency for New Technologies, Energy, and Sustainable Economic Development (ENEA) enriched the analysis with insights into soil health, sustainability, eco-innovation, agri-food systems, and biodiversity. The European Science Policy Interface on Biodiversity and Ecosystem Services (ALTERNET), deploying EKLIPSE, established in 2016, emerged as a key knowledge actor, synthesizing knowledge from diverse sources to inform decision-making on biodiversity, climate change and food security in Europe. The Cyprus University of Technology (CUT) and Wageningen University and Research (WUR) provided significant inputs, thanks to their expertise in biodiversity-related policies, contributing to the gathering of documentation and receiving valuable feedback. These inputs were essential for critically assessing policies and ensuring their relevance. In adopting the expert consultation methodology and collaborating with a diverse set of stakeholders, this analysis benefitted from a wealth of perspectives. The Eco-Ready Project Partnership, JRC, CONFAGRICOLTURA, IUCN, ENEA, ALTERNET, EKLIPSE, CUT, and WUR collectively enhanced the robustness and

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comprehensiveness of the approach, ensuring the policy relevance and a well-rounded understanding of the intricate relationship between data and policies in agri-food systems. In a different way, the Method 19 'Systematic Map' was based on structured, stepwise methodology: the systematic search was conducted using a combination of Boolean operators 'AND' and 'OR' to refine the search strategy. 'Climate Change' (CC), 'Biodiversity' (BD), and 'Food Security' (FS) were used as main keywords, and 'Environment', 'Water', 'Energy', 'Health', 'Economic', and 'Society' as secondary keywords were employed to ensure a comprehensive and targeted exploration of the relevant policies in EUR-Lex, the official database of the Publications Office of the European Union.

An organized file (Table S1, included in the Supplementary Material section) was compiled to collect and catalogue the essential information derived from the systematic search. The file, as outlined in the 'READ_ME' spreadsheet, encompasses key parameters for a comprehensive understanding of the collected documents, which are listened below (Table 1).

Table 1:

Type of Document
Title of Document
Authority
Year of Publication
Link to the Document
Main Keywords (Climate Change (CC), Biodiversity (BD) and Food Security (FS))
Secondary Keywords (categorized into Society, Economics, Health, Energy, Environment, Water)

This structured approach ensured the systematic and efficient management of data, allowing for transparent documentation of the search results and facilitating further analysis.

A thorough generic analysis of the screened documents using a two-fold approach involving an R script and VosViewer (https://www.vosviewer.com) was applied. This approach aimed at extracting insights into the primary keywords within the collected documents and unravelling the connections among them. The analytical framework enabled a detailed exploration of the relationships between key terms, thus providing a comprehensive overview of the core findings and a deeper understanding of the underlying patterns within

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the dataset. Specifically, 101 documents (.pdf files) resulting in more than 10,000 pages were screened. (Keywords were extracted approximately 4,500 times based on words' frequency within each EU document. For the implementation of the R script, the pdftools library was employed (RStudio Version 1.2.5033; R version 3.6.2). Keywords were inspected and harmonised across files and a numeric matrix was generated. The matrix was converted to a binary form were '1' represented the presence of a keyword, and '0' its absence. The binary matrix was used as an input to create files complying to the *.RIS* and *BibTeX* format that were later used for VOSViewer (version 1.6.20) and R Bibliometrix analyses, respectively. After the initial screening, based on the established criteria and the use of Boolean operators 'AND' and 'OR,' a subsequent sub-screening was implemented to specifically target policy documents. This sub-screening involved filtering the results to include only those documents that contained all three main keywords identified during the systematic search (CC, BD and FS). The figure 3 summarizes all the steps involved in the methodological approach used for screening relevant policies in the areas of food safety, climate change, and biodiversity (Figure 3). The table below shows the results obtained after the sub-screening filtering process (Table 2).

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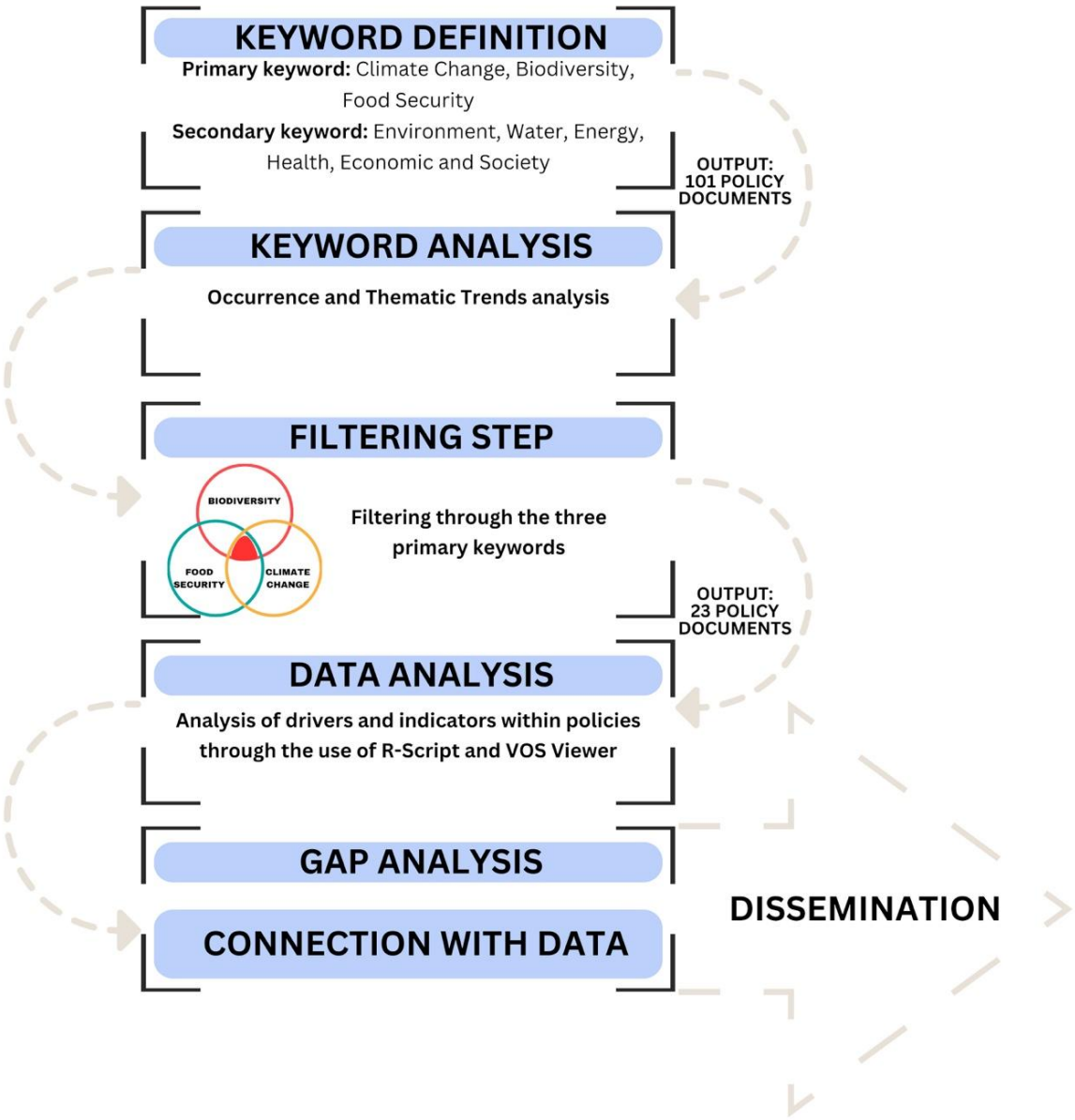

Figure 3: Overview of the methodological approach for screening policies related to food safety, climate change, and biodiversity.

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Table 2: Sub-screened policy documents list (based on documents that contained all three main keywords identified during the systematic search (CC, BD, and FS)

Type of document	Policy name	Date of publication	Authority	Link
Decision 1386/2013/EU	General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'	20 Nov 2013	The European Parliament and the Council of the European Union	https://op.europa.eu/en/publication-detail/-/publication/b8e613ef-76de-11e3-b889-01aa75ed71a1
Regulation (EU) N. 1310/2013	Support for rural development by the European Agricultural Fund for Rural Development (EAFRD), amending Regulation (EU) No 1305/2013 of the European Parliament and of the Council as regards resources and their distribution in respect of the year 2014 and amending Council Regulation (EC) No 73/2009 and Regulations (EU) No 1307/2013, (EU) No 1306/2013 and (EU) No 1308/2013 of the European Parliament and of the Council as regards their application in the year 2014	17 Dec 2013	The European Parliament and the Council of the European Union	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02013R1310-20131220
Regulation (EU) 2016/429	Transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law')	9 March 2016	The European Parliament and the Council of the European Union	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0429
Regulation (EU) 2018/841	Inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU	30 May 2018	The European Parliament and the Council of the European Union	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841
Regulation (EU) 2018/2001	Promotion of the use of energy from renewable sources	11 Dec 2018	The European Parliament and the	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001

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			Council of the European Union	
Communication COM/2019/640 final	The European Green Deal	11 Dec 2019	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640&qid=1690884927805
Communication COM/2020/98 final	A new Circular Economy Action Plan For a cleaner and more competitive Europe	11 March 2020	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN
Communication COM/2020/380 final	EU Biodiversity Strategy for 2030	20 May 2020	European Commission	https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX%3A52020DC0380
Communication COM/2020/381 final	A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system	20 May 2020	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381
Communication COM/2021/82 final	Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change	24 Feb 2021	European Commission	https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:52021DC0082
Regulation (EU) 2021/1119	Establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')	30 June 2021	The European Parliament and the Council of the European Union	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R1119
Communication COM/2021/550 final	'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality	14 July 2021	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0550&from=EN
Communication COM/2021/551 final	Establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation	14 July 2021	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0551
Communication COM/2021/699 final	EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate	17 Nov 2021	European Commission	https://www.horizon-europe.gouv.fr/sites/default/files/2021-11/strat-gie-europ-enne-pour-les-sols-2030-pdf-4963.pdf

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Regulation (EU) 2021/2115	Establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013	2 Dec 2021	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG
Regulation (EU) 2021/2116	Financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013	2 Dec 2021	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG
Regulation (EU) 2021/2117	Establishing a common organisation of the markets in agricultural products, (EU) No 1151/2012 on quality schemes for agricultural products and foodstuffs, (EU) No 251/2014 on the definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the Union	2 Dec 2021	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0262.01.ENG
Communication COM/2022/304 final	Proposal for a Regulation on nature restoration	22 June 2022	European Commission	https://environment.ec.europa.eu/system/files/2022-06/Proposal%20for%20a%20Regulation%20on%20nature%20restoration.pdf
Communication COM/2022/305 final	Proposal for a Regulation on the sustainable use of plant protection products and amending Regulation (EU) 2021/2115	22 June 2022	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0305
CBD/COP/DEC/23/15	Convention Biological Diversity 2022	19 Dec 2022	United Nations	https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf
Communication COM/2023/35 final	Revision of the EU Pollinators Initiative. A new deal for pollinators	24 Jan 2023	European Commission	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A35%3AFIN&qid=1674555285177

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Communication COM/2023/102 final	EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries	21 Feb 2023	European Commission	https://oceans-and-fisheries.ec.europa.eu/system/files/2023-02/COM-2023-102_en.pdf
Communication COM/2023/103 final	The common fisheries policy today and tomorrow: a Fisheries and Oceans Pact towards sustainable, science-based, innovative and inclusive fisheries management	21 Feb 2023	European Commission	https://oceans-and-fisheries.ec.europa.eu/system/files/2023-02/COM-2023-103_en.pdf
Communication COM/2023/416 final	Proposal for a Directive on Soil Monitoring and Resilience (Soil Monitoring Law)	5 July 2023	The European Parliament and the Council of the European Union	https://environment.ec.europa.eu/system/files/2023-07/Proposal%20for%20a%20DIRECTIVE%20OF%20THE%20EUROPEAN%20PARLIAMENT%20AND%20OF%20THE%20COUNCIL%20on%20Soil%20Monitoring%20and%20Resilience_COM_2023_416_final.pdf

This additional refinement ensured a focused analysis on policy-related materials relevant to the study objectives. The assessment of the relevant EU policies and the identification of gaps between data and policy was carried out by selecting and using a list of keywords related to the main indicators and drivers of CC, BD, and FS. To examine potential gaps between policy documents and essential evaluation criteria, key drivers and indicators considered fundamental through outcomes of WP1 tasks 1.1, 1.2, and 1.3 were identified. For this purpose, the tables below list the drivers and indicators (Table 3 and Table 4). In the context of environmental and agri-food policy, drivers and indicators are key concepts that help understand and measure the impact of various factors on ecosystems and food systems. Drivers are factors that cause change in an ecosystem or a system. They can be natural or human-induced and can have direct or indirect effects. For example, climate change, characterized by global warming, changes in precipitation, and extreme weather events, is a major driver affecting both biodiversity and agricultural productivity. Similarly, agricultural practices, such as the use of fertilizers and pesticides, are drivers that can impact soil health, water quality, and biodiversity. Indicators, on the other hand, are measures used to assess the state or trend of a system. They provide information about the impact of drivers and can help in monitoring and managing these impacts. For instance,

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marine biodiversity, freshwater biodiversity, and ecosystem degradation are indicators of the health of aquatic ecosystems. Analogously, the carbon cycle and nitrogen cycle are indicators of the impact of agricultural practices on greenhouse gas emissions and nutrient cycling in the soil (Table 3 and Table 4). After the identification of the primary drivers and indicators across the core collection of files, a focused bibliometric analysis was conducted following a similar but more concise data mining and network scheme. Drivers and indicators were regarded as keywords and an R script (pdfsearch library) was employed in order to screen 44 core EU documents (including annexes; keywords were set before the analysis). The R script produced a file (list of keywords per document) that was further converted to a *.RIS* and a *BibTeX* format. These files were subsequently used for import to VOSViewer and Bibliometrix suites respectively for cluster analyses.

Table 3: List of drivers and indicators related to Food Security, Biodiversity and Climate Change

Dimension	Category	Drivers
Climate Change	Global Warming	Global warming, Greenhouse gas, Methane emission
	Ocean Conditions	Sea bottom temperature, Sea surface temperature, Ocean acidification, Ocean oxygen depletion, Coral reef habitat, Algae boom
	Weather Events	Drought, Floods, Extreme weather event
	Atmospheric Conditions	Precipitation, Global solar radiation, Wind
	Snow and Ice Conditions	Snow cover, Upwelling
Biodiversity	Land Use and Management	Crop rotation, Field margin vegetation diversity, Afforestation, Reforestation, Land use, Tillage, Permanent grassland, Field margin type, Agroforestry
	Species Diversity	Native crops, Invasive species, Crop wild relative, Invasive plant specie
	Pesticides and Herbicides	Herbicides, Pesticide, Biopesticide, Weed management
	Biological Interactions	Fungi, Pathogens, Rhizobacteria, Pest

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Food Security	Nutrient Management	NPKS (Nitrogen, Phosphorous, Potassium, Sulphur), Macronutrient, Micronutrient, Availability for fertilisers
	Agricultural Practices	Herbicide, Digital farming, Heat stress, Organic agriculture, Conventional agriculture, Soil moisture, Pesticide resistance, Integrated agriculture, Water consumption, Precision farming, Desalinated seawater use, Groundwater availability, Groundwater level, Groundwater quality, New breeding, Seasonal grazing, Tillage, River flow, Earlier harvesting, Antibiotic, Water demand, Greenhouse, Manure, Intercropping, Cover crops, Feed, Feed quality
	Crop and Animal Management	Crop genetic diversity, Resistant cultivar, Inbreeding, Productivity, Animal diet, Crop mixture, Nitrogen, Hydroponic, Pollination, Novel food, Flower strips, Vaccination, Sustainable intensification
	Food and Diet	Consumer diet, Food access, Nutritional quality
	Climate Mitigation and Adaptation	Mitigation, Carbon footprint, Carbon sequestration, Marine heatwave
	Agricultural Systems	Agricultural heritage systems, Wastewater, Microbiome, Ecosystem, One health

Table 4: List of indicators related to Food Security, Biodiversity and Climate Change

Dimension	Category	Indicators
Climate Change	Greenhouse Gases	CO_2 (Carbon dioxide), CH_4 (methane), N_2O (nitrous oxide), Soil emission
	Temperature and Precipitation	Temperature, Precipitation change, Standardized Precipitation Evapotranspiration Index (Spei), Soil Water Index (Swi)
	Climate and Water	Aquifer sustainability, Green blue water
Biodiversity	Species Abundance	Marine biodiversity, Bird abundance, Spider abundance, Bee abundance, Insect abundance, Predator abundance, Parasite abundance, Red deer
	Vegetation	Vegetation diversity, Floral composition, Weed species, Dwarf shrub abundance, Vegetation height, Rough grass

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	Soil Health and Diversity	Soil fertility, Soil health, Soil indicator, Soil moisture, Bacterial diversity, Fungal diversity, Microeukaryote diversity
	Genetic Diversity	Genetic Modified Organisms (GMO), Inbreeding, Genetic diversity, Antibiotic resistant gene
Food Security	Agriculture	Yield, Harvest product, Cropping pattern, Farm payment, Farm labour, Farm area average, Feed conversion ratio, Feed efficiency, Energetic balance, Self sufficiency
	Economic Indicators	Nutritional value, Produce price, Product price, Producer price index
	Food and Environment	Ecosystem degradation, Desertification, Soil emission, Non-biotic indicators, Carbon cycle, Nitrogen cycle, Home feeding
	Biodiversity in Agriculture	Earthworm, Mycotoxin, Weed species, Taxa, Floral composition, Natural enemy richness, Dwarf shrub abundance, Rough grass, Structural heterogeneity

To conduct a thorough analysis of gaps within the screened policy documents, a comprehensive examination was done to establish links between the identified gaps and pertinent data. Indeed, once defined the main gaps present in each document, a literature data analysis has been provided to offer insights and correlation with data. This approach aimed to facilitate a critical assessment of the selected policy documents, uncovering connections with available data, and identifying potential areas for improvement.

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4. Results and Discussion

The evolution of European policy documents on Climate Change (CC), Food Security (FS), and Biodiversity (BD) not only reflects thematic shifts but also underscores a growing emphasis on sustainability transition and resilience in recent years. In the screened policy documents from 1962 to 2009, the predominant keywords *genetics*, *protection*, and *policy* highlighted an initial understanding of biodiversity and a commitment to protective measures. This suggests that awareness and understanding of environmental issues played a role in shaping early policies. However, the subsequent period (2010-2018) showed the inclusion of *market* and *conservation*, indicating a balancing act between economic considerations and conservation efforts. Economic factors may have become key drivers in shaping policies during this period. As the timeline progressed (2019-2021), the emergence of *water* and *biomass* suggested an increasing focus on resource management and sustainable energy. This suggests that concerns about resource scarcity and sustainable development influenced policy directions. There is a continued consideration of economic factors (*market*) alongside an increased awareness of the importance of water resources and renewable energy sources. In the most recent phase (2022-2023), the keywords *environment*, *biodiversity*, and *degradation* reflect a more holistic approach to environmental challenges. This may be driven by a deeper understanding of environmental challenges and a commitment to ecological well-being. The broader emphasis on the *environment* indicates an overarching commitment to ecological well-being, while *biodiversity* underscores the importance of preserving diverse ecosystems, essential for long-term sustainability and an alignment to the 'one-health' concept. Moreover, the attention to *degradation* implies a recognition of the need for resilience-building measures to counteract the adverse effects of human activities on environmental health. The shift towards sustainability transition suggests a strategic orientation towards practices and policies that promote sustainable development, balancing environmental, social, and economic dimensions. The recent policy documents not only demonstrate a holistic understanding of environmental challenges, but also indicate a focus on sustainability transition and resilience. Policymakers are increasingly recognizing the imperative of integrating environmental considerations into broader frameworks that promote long-term resilience and sustainability in the framework of evolving climate, food security, and biodiversity challenges. The thematic evolution, as reflected in the European policy

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documents concerning CC, FS and BD has undergone a notable shift over time (Figure 4). Enhanced focus on environmental issues, biodiversity preservation, and understanding ecosystem degradation for the relationship between preserving biodiversity, ecosystem health, and ensuring sustainable food sources in the context of Climate Change-related challenges. There is still much to do anyway, as the environmental results of the implementation of the current CAP are not yet known, and there seems to be still much to do (https://ieep.eu/publications/environmental-and-climate-assessments-of-cap-strategic-plans/).

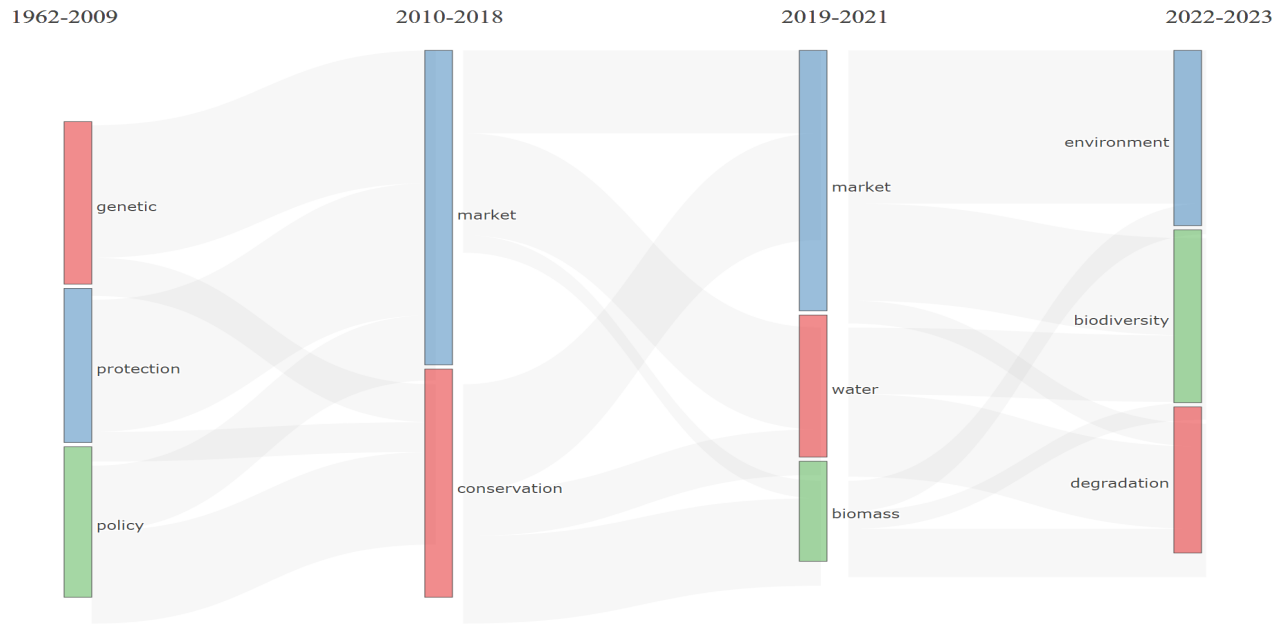

Figure 4: Sankey diagram showing the keywords thematic evolution across epochs (based on R-Bibliometrix analysis)

The European legislative documents considered for this report are displayed in relation to their relevance to food security resilience (Figure 4). The visual representation of keywords in European sub-screened legislative documents illustrates crucial topics concerning the impact of climate change and biodiversity on food security (Figure 5). Prominent words are *mitigation*, *yield*, *greenhouse gas*, *ecosystems*, *feed*, *land use*, *productivity*, related to sustainable agricultural practices and environmental impact management. These terms, proportionally sized and closely interlinked, underscore a focus on strategies to mitigate environmental impact, optimise agricultural yield, and manage land use in the context of evolving ecosystems (Figure 5; Figure 6).

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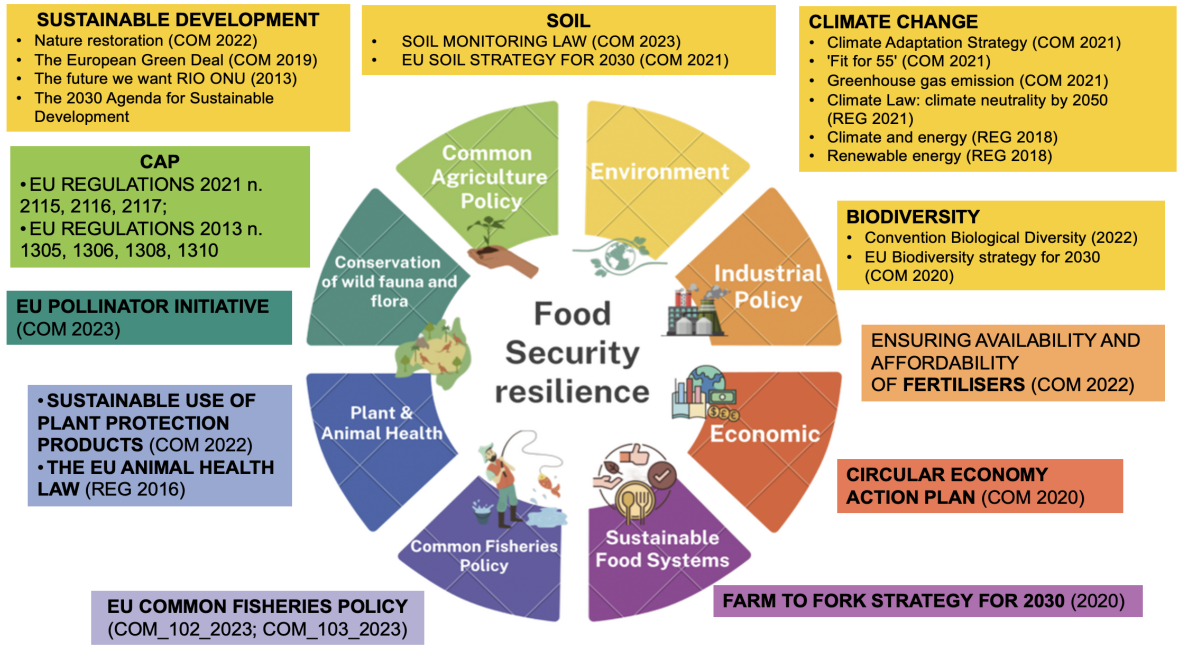

Figure 5: European Legislative Documents assembled according to EUR-LEX Topic Classification (for details on methodology and results see Annex 1).

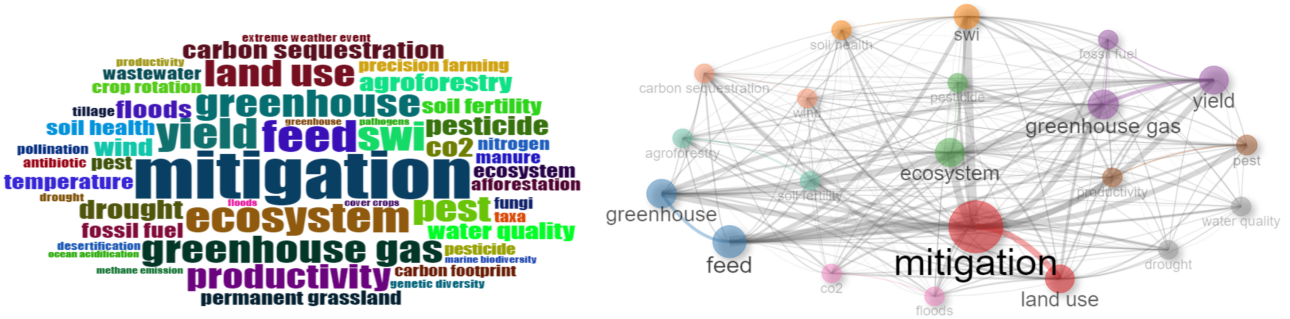

Figure 6: Bibliometric cluster analyses of the sub-screened EU policy (based on R-Bibliometrix and the VOSViewer software)

As shown in the network map of the sub-screened policy documents (Figure 7), specific nodes assume central positions, indicating robust correlations and dominance in policies discussions. Key terms such as *global warming*, *greenhouse gas*, *pesticide*, and *water quality* occupy central spots, underscoring their interconnectedness and prevalence in current dialogues. Conversely, other important concepts like *Genetic Modified Organisms (GMO)*, *precision farming*, and *ecosystem degradation*, are in the map's periphery or beyond, suggesting potential limited direct correlation with core concepts or less emphasis in ongoing discussions. Nodes like *ecosystem degradation*, *one health*, *soil indicators*,

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organic agriculture are positioned at the map's edges despite their extreme implications for climate, environment, and agriculture, suggesting a lack of synchronization to current research outputs, and possible gaps in legislation. Furthermore, terms such as *food access* appear outside the map's main core. Despite its role in modern agriculture and substantial impacts on the environment and climate, it exhibits a loose connection to the other represented concepts, suggesting a marginal presence in current environmental policy discussions. This marginalization may raise questions about the extent to which environmental policy frameworks comprehensively integrate and address issues related to food access. Given the intricate interconnections between agriculture, the environment, and climate, the divergence of food access from the network's main core highlights an area that may warrant increased attention and consideration within the realm of environmental policymaking. However, it is important to note that certain initiatives are actively addressing this concern. For instance, the Farm to Fork (F2F) strategy, a key component of contemporary agricultural and environmental policy, explicitly takes into consideration the issue of food access and underscores its significance. The F2F strategy recognizes the integral role of ensuring equitable access to food within the broader context of sustainable agriculture, environmental conservation, and climate resilience. By acknowledging the importance of food access, the F2F strategy exemplifies a comprehensive approach that intertwines agricultural practices with social considerations, providing a promising framework for the integration of food access into broader environmental policy discussions. The arrangement of nodes conveys their relational importance within the map rather than absolute significance. Central nodes typically represent dominant themes, while those at the periphery or beyond might lack centralization or direct correlations with other represented concepts (Figure 7).

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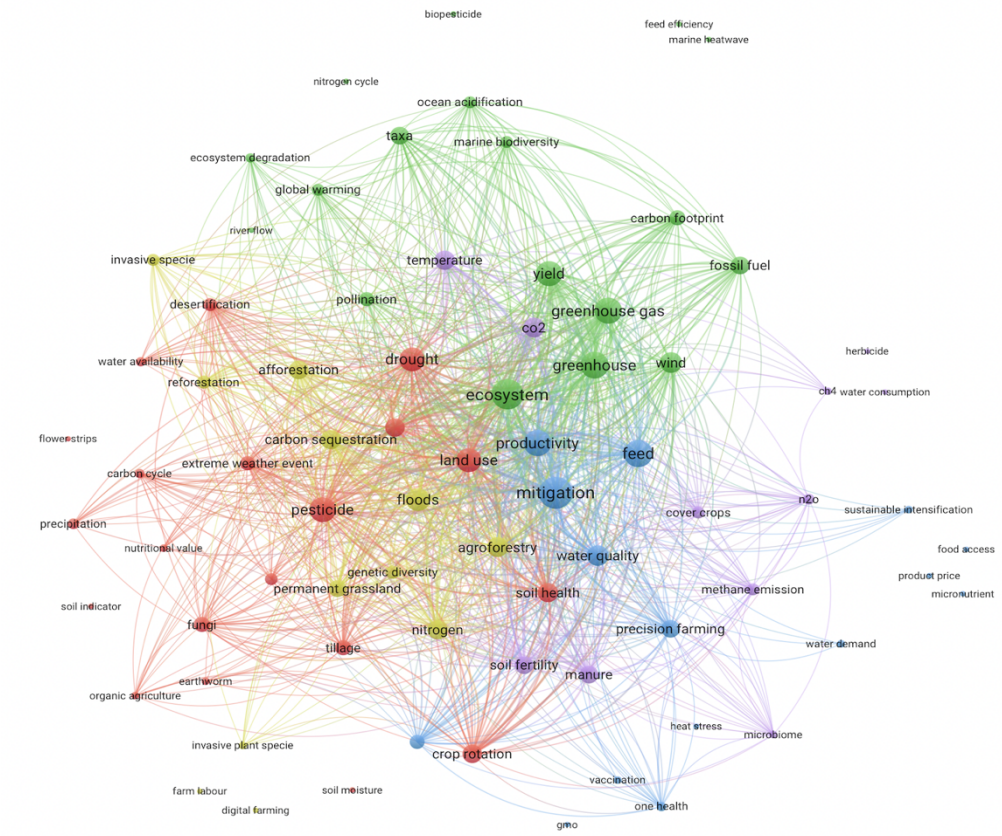

Figure 7: Keyword network map of the sub screened EU policy (based on R script and the VOSViewer software). Online resources at

https://app.vosviewer.com/?json=https://drive.google.com/uc?id=14rAGM6Hcr2XUsRNDoxBaPzyIirIWM1fp

Roadmap to Results and Discussion: A Breakdown of Sections 4.1-4.4

This brief section aims to provide a coherent understanding of the document's structure and how to best approach reading it. Each section (paragraphs 4.1-4.4) begins with a general description, providing an overview of the EU's strategies and policies analysed, such as the Green Deal, F2F, and CAP (4.1), and their roles in addressing food security, climate change, and biodiversity loss. Following the general description, a gap analysis is presented. This analysis identifies areas where current strategies may fall short or where additional information and clarity are needed. Each section also includes connections with relevant scientific articles. These references provide evidence-based support for the strategies discussed and offer insights into the impact of agricultural practices on various

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environmental and social factors. Finally, each section concludes with an impact assessment. This part evaluates the potential effects of the EU's policies on food security, climate change mitigation, and biodiversity preservation. It considers the political, economic, and social implications of these strategies.

4.1. Pillars of Resilience: Green Deal, Farm to Fork, and CAP policy ensuring Food Security in a changing climate and biodiversity loss threat context

In the context of global challenges threatening the 21st century, few issues are as pressing and interconnected as food security, climate change, and biodiversity loss. The synergy of the 'Green Deal' and its 'Farm to Fork' Strategy emerges as a robust framework strategically designed to address the critical intersection of food security, climate change, and biodiversity loss. The F2F strategy represents the European Union's commitment to fostering a more sustainable and resilient food system. This holistic approach, tracing the entire lifecycle of food production, aims to ensure that food must be not only nutritious but also produced with the consideration for environmental impact. From reducing the use of pesticides to promoting organic farming, F2F acts as a compass guiding the agricultural sector toward practices that harmonise with nature and mitigate the risks posed by climate change. For instance, Directive (EU) 2019/633[8] focuses on unfair trading practices in the agricultural and food supply chain, promoting fairer remuneration for farmers. Additionally, Regulation (EU) 2018/848[9] establishes the framework for organic production, ensuring the growth of organic farming, an integral component of the sustainable agriculture paradigm advocated by F2F. Central to the European Union's ambition for a carbon-neutral continent by 2050, the Green Deal is a transformative agenda including

[8] European Union. (2019). Directive 2019/633: Unfair trading practices in business-to-business relationships in the agricultural and food supply chain1. Retrieved from https://eur-lex.europa.eu/legal-content/it/TXT/?uri=CELEX%3A32019L0633

[9] European Union. (2018). Regulation 2018/848: Organic production and labelling of organic products and repealing Council Regulation (EC) No 834/20072. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R0848

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several sectors, among which agriculture. By setting ambitious targets for reducing greenhouse gas emissions, fostering biodiversity, and promoting circular economies, the Green Deal predicts a coexistence between agricultural productivity and ecological health, underlining the imperative for a sustainable future. Regulation (EU) 2021/1119[10] sets binding targets for member states to reduce greenhouse gas emissions, emphasising the agricultural sector's role in achieving carbon neutrality. Further, the regulation outlines *eco-schemes* within the Common Agricultural Policy, incentivizing environmentally friendly farming practices, thus aligning agricultural activities with broader environmental goals, though these eco-schemes are voluntary, and it is still to be seen their effectivity.

4.1.1. Introducing the Common Agricultural Policy: unravelling the gaps and proposing data-driven enhancements for policy evolution

A long-lasting foundation of European agricultural governance, the CAP faces continuous evolution to align with contemporary challenges. Regulation (EU) 2020/2220[11], part of the CAP reform package, introduces these eco-schemes and defines their implementation. The Regulation also outlines the CAP Strategic Plans, requiring member states to integrate environmental and climate objectives into their agricultural policies; thus, embedding sustainability at the heart of agricultural governance, with the imperatives of climate resilience and biodiversity conservation. As the global climate continues to shift and biodiversity faces serious threats, these three interlinked policies need further integration. The Green Deal places a strong emphasis on the alignment of CAP Strategic Plans with its overarching ambitions, stressing the necessity for these plans to adequately reflect environmental and climate goals: it is urgent to align with both EU climate legislation and National Energy and Climate Plans. The F2F and Biodiversity Strategies delineate a comprehensive set of targets, ranging from reducing pesticide use, antimicrobial sales, and nutrient losses via promoting organic farming and preserving biodiversity. For instance, reducing pesticide use involves an overall reduction goal, while promoting organic farming seeks to increase the proportion of agricultural land dedicated to organic practices. These

[10] European Parliament and the Council of the European Union. (2021). Regulation (EU) 2021/1119: Establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R1119

[11] European Union. (2020). Regulation 2020/2220: Laying down certain transitional provisions for support from the European Agricultural Fund for Rural Development (EAFRD) and from the European Agricultural Guarantee Fund (EAGF) in the years 2021 and 20223. Retrieved from https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32020R2220

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shared targets, such as reducing antimicrobial sales, necessitate the active participation of CAP Strategic Plans. CAP's role in supporting Green Deal ambitions becomes clear through mandatory sustainability standards and voluntary eco-schemes tools. These tools are designed to promote practices and approaches such as precision agriculture and organic farming, aiming to enhance sustainability and competitiveness in the food sector. However, to ensure the effectiveness of CAP in achieving Green Deal targets, robust monitoring and assessment mechanisms are essential. It is necessary to adopt a common data approach and cooperation between Member States and the Commission to guarantee the quality of data for monitoring and evaluation. This reveals a potential weakness in the current system's ability to provide precise and relevant data. CAP Strategic Plans' implementation is an essential step, considering the ongoing collaborative efforts between Commission services, Member States, and stakeholders. The introduction of mandatory standards, such as crop rotation, soil cover, and landscape features are helpful. Nevertheless, specific details about indicators and baseline levels are needed for a more comprehensive understanding. Eco-schemes emerge as a flexible funding source for environmental and climate action within CAP. Increased ambition in environmental and climate objectives and the flexibility of CAP to adapt to evolving environmental and economic circumstances are indispensable. Also, the qualitative and quantitative judgement of ambition levels in CAP Strategic Plans is a key element for effective implementation. In the CAP's current approach, the role of the Commission may require reinforcement, and the need for new efforts to guarantee data quality implies existing challenges. The effectiveness and benchmarking of eco-schemes hints at potential difficulties in ensuring their success. Also, the fact that they are voluntary means that there is no guarantee about their uptake up. Moreover, the proposed integration of animal welfare and antibiotics legislation in the CAP Strategic Plan Regulation is seen as a positive step. However, the lack of detailed information on how this integration will be carried out may pose a potential gap in understanding the practical implementation. The areas requiring improvement or more detailed information include data quality assurance, clarity on eco-schemes, and the integration of animal welfare and antibiotics legislation. Spatial restraints that reduce the neighbouring of animal and vegetable farms must be considered, in order to minimize exposure to microbial agents (*E. coli*, *Salmonella sp.*, and *Listeria sp.*) that can cause outbreaks. These considerations are essential for a robust and effective implementation of the CAP in alignment with Green Deal objectives (Schader et al. 2017; Lampkin et al 2020).

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In the CAP document, several drivers/ keywords related to agricultural practices and environmental factors are well-addressed. These keywords, which include terms like *global warming, sea surface temperature, precipitation, wind, drought, floods, soil moisture, water consumption, greenhouse gas, afforestation, carbon sequestration, reforestation, and ecosystem,* among others, fundamental for understanding the policies and objectives related to the CAP in the agricultural sector. The drivers listed in the document cover a wide range of factors that influence agriculture and the environment. These include climate change factors such as *global warming, precipitation, wind, drought, floods, and greenhouse gas*. There are also drivers related to biodiversity, such as *afforestation* and *reforestation*. Furthermore, drivers correlated to agricultural practices, such as *soil moisture* and *water consumption* were found. The concept of *organic agriculture* is also thoroughly addressed in the document. *Organic agriculture,* often described in the CAP documents as *organic farming,* represents a holistic agricultural approach that prioritises ecological sustainability, biodiversity conservation, and minimising synthetic inputs (Gamage et al. 2023). While considering organic agriculture's environmental and health benefits, a critical and scientific examination reveals both strengths and limitations. Organic agriculture guarantees soil health through practices like crop rotation, cover cropping, and minimal soil disturbance. These contribute to improved soil structure, water retention, and microbial diversity. It represents an essential approach to farming aligned with sustainable practices and responsible land use. While it has numerous advantages, including promoting soil health, biodiversity, and reducing environmental impact, one of the limitations is associated with its potential role in the spread of antibiotic resistance. Indeed, organic farming often relies on animal manure as a natural fertiliser, contributing to soil fertility. Animals in organic farming systems may be treated with antibiotics to ensure their health. Using manure from these animals can introduce antibiotic residues into the soil, potentially contributing to the development of antibiotic-resistant bacteria (Guo et al. 2023). Zalewska et al. (2021) analysed the consequences of the application of animal manure in agriculture, particularly concerning the spread of antibiotic resistance. They examined the presence of pathogens, potentially pathogenic microorganisms, and antibiotic resistance genes (ARGs) in animal manure, evaluating their effect on human health through exposure to soil and plant resistomes, emphasising the potential threat to human and animal health posed by the dissemination of ARGs to arable soil and edible crops through the application of manure as a fertiliser. Moreover, in the same context, Garske

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et al. (2020), highlighted the importance of refining the governance of food waste to align with the objectives of the F2F policy. The specific recommendations for improvement by economic instruments indicate that there are areas within the current legislation that may not be fully effective in addressing food waste and promoting a circular economy in the food system. Therefore, integrating the insights and recommendations into the F2F policy can contribute to its continuous improvement and ensure that it effectively addresses the challenges associated with food waste governance. The driver s*ustainable intensification* refers to increasing agricultural productivity while minimising negative environmental impacts and enhancing ecosystem services. It's a key strategy for achieving food security in a sustainable manner. A comprehensive analysis involving social, economic, and environmental benefits associated with these services would be crucial for a thorough understanding of the sustainable intensification framework. In particular, a detailed examination of ecosystem services can elucidate their multipart contributions to social well-being, economic stability, and environmental health. Socially, these services are essential in community livelihoods, access to resources, and overall quality of life. Economically, they can contribute significantly to several sectors, such as agriculture, tourism, and healthcare, thereby fostering sustainable economic development. Environmentally, a detailed examination of ecosystem services allows them to gain their role in biodiversity conservation, climate regulation, and soil health. By addressing these aspects in detail, it will not only gain a deeper insight into the complexities of *sustainable intensification*, but also facilitate the decision-making and policy formulation processes. In addition to these, a driver that could provide further depth to the policy includes *integrated agriculture*. It refers to combining different farming practices for better productivity and sustainability. However, despite the absence of the keyword *integrated agriculture*, some related terms e.g. *crop rotation* are present. Farmers protect soils and preserve their potential through crop rotation. All Strategic Plans include this as a new baseline condition for farmers instead of a new GAEC (good agricultural and environmental conditions) obligation, and rotation will take place on approximately 85% of arable land supported by the CAP. Crop rotations will also help to break disease and pest cycles, and the reduction of pesticide use. Additionally, CAP Strategic Plans will help farmers restore soil fertility, reaching up to 47% of EU agricultural land, for example, through improved crop rotation, conservation agriculture, intercropping, or cover cropping in horticulture (Quintarelli et al. 2022; Ebbisa et al. 2022). This also contributes to increased water

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retention capacity and drought resilience. The indicators listed in the CAP policy cover a range of measures used to assess the impact of drivers. These include biodiversity indicators, such as *marine* and *freshwater biodiversity*, indicators of *ecosystem degradation* and *desertification*, and indicators related to the *carbon* and *nitrogen cycle*. However, indicators that measure the impact of agricultural practices on water quality need to be more explored, being critical factors for environmental sustainability. Other missing indicators refer to the amount of crop produced per unit land area. These indicators are essential for assessing agricultural performance. While the CAP provides a solid framework towards achieving fair, healthy, and environmentally friendly food systems, incorporating important drivers and indicators mentioned could potentially enhance its effectiveness and comprehensiveness. It's important to underline that their inclusion should be based on the specific context and objectives of the policy and should be supported by scientific evidence and stakeholder consultation. For instance, Liu et al. (2023) discussed the development of a prey-predator species distribution model for a large piscivorous fish, highlighting the importance of considering these factors in policymaking. Similarly, Gao et al. (2021) simulated and predicted shifts in land suitability for maize cultivation worldwide due to climate change, thus, providing valuable insights that could be relevant for the CAP. Furthermore, Granco et al. (2019) focused on the potential effects of climate change on Brazil's land use policy for renewable energy from sugarcane underscores the need for policies like the CAP to consider the impacts of climate change on land use and renewable energy sources. Hassani et al. (2021) studied global predictions of primary soil salinization under changing climate in the 21st century, highlighting the importance of monitoring soil health indicators, such as soil salinity, in the face of climate change. These studies, among others, underscore the importance of a comprehensive and adaptive approach in agricultural policies to ensure the sustainability and resilience of our food systems in the face of a changing climate and other environmental challenges. Incorporating these concepts into the revised CAP could provide a more holistic approach towards achieving goals and data-driven decisions. Recanati et al. (2019) analysed 165 papers offering policy recommendations for the future of the CAP. The analysis focused on three pillars: environment, farmers' livelihoods, and citizens' nutrition and health. The study highlighted that CAP lacked explicit attention to citizens' nutrition and health. Key challenges and improvement areas identified in the literature included the need to maintain financial support for young farmers and specific sectors, such as horticulture. The literature

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consistently advocated for better-integrated, participatory, and multi-disciplinary research to tailor policies to diverse EU environmental conditions and farming practices. This included supporting knowledge transfer platforms and adopting evidence-based guidelines/policies through integrated evaluation frameworks and databases. The importance of a revised, integrated approach to policy-making that considers social, environmental, food, and agricultural policies as interconnected elements of a 'whole-food system' was recently emphasised (Recanati et al., 2019). The CAP aims to ten objectives directly aligned with the Green Deal and the EU's sustainability targets for agriculture and rural regions. The concept of the revised CAP is to function as both an incentive tool for European farmers, encouraging them to take steps as a main actor in addressing climate change, safeguarding the environment, and transitioning towards more sustainable and resilient food systems. As reported by Boix-Fayos et al. (2023), the shift from conventional to organic or more sustainable farming under the Green Deal faces several interlinked challenges. One key challenge is *maintaining yields*, especially with concerns about whether a 25% increase in European organic agriculture can meet the food demands. Studies indicated potential yield decreases under organic farming, raising questions about its capacity to feed the population adequately. This challenge aligns with actions related to soil health, biodiversity, and food security in the strategies. Another challenge is the *nitrogen needs* of organic agriculture: while rotations with legumes can supply nitrogen, they also reduce the available area for main crops, impacting overall productivity. This challenge links to actions focused on water resources within the strategies. The challenge of increased land demand in organic farming, potentially requiring more land for lower yields, poses environmental risks associated with expanding arable land, aligning with actions for sustainable food production and waste reduction. Moreover, addressing food distribution and access challenges beyond production, reduced agricultural inputs may intensify food insecurity, highlighting the need for holistic solutions aligning with strategies focused on food security and access (Boix-Fayos et al. 2023).

4.1.2. The European Green Deal and the Farm to Fork strategy: unravelling the gaps and proposing data-driven enhancements for policy evolution

The F2F strategy is a fundamental component of the European Green Deal with a vision to establish equitable, healthy, and ecologically based food systems. Central to these strategies are the drivers, which exert a direct influence on agricultural practices and their

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subsequent outcomes. Important drivers are mentioned in the strategies, such as the *one-health* concept, *food access, nutritional quality, precision farming, land use, seasonal grazing, inbreeding, antibiotic use, methane emission, animal diet, water quality* and *consumer diet*. Considering the current socio-political situation, despite the impact of the pandemic and Russia's conflict with Ukraine and climate change on production, the European Union's food system maintains its strength and dependability. However, the European agricultural sector relies on importing essential goods like *animal feed*, making it vulnerable. The driver *animal feed*, less extensively explored, is an aspect that should be considered with particular attention in this context. Animal feed is imported in a net capacity and given the susceptibility and the elevated costs of inputs such as energy and fertilisers, farmers encounter[12]. Among other drivers analysed, the not thoroughly discussed, the limited discussion about processes such as '*upwelling*' potentially underestimate the profound implications of climate change on marine food systems. Upwelling is a fundamental oceanographic process, involving the upward movement of deep and cold waters towards the ocean surface. This phenomenon is often triggered by the convergence of ocean currents, coastal winds, or the presence of underwater barriers. When deep waters rise to the surface, they bring with them nutrient-rich substances such as nitrates and phosphates, crucial for the growth of phytoplankton, the foundation of the marine food chain. The significance of upwelling in the context of food security is closely related to its impact on biological productivity in the oceans. Phytoplankton, sustained by the nutrients brought to the surface through upwelling, represents the primary food source for many marine species, including commercially important fish. The health and abundance of these marine organisms, in turn, influence the livelihoods of communities dependent on fisheries and aquaculture. In the face of climate change and biodiversity loss, understanding and monitoring upwelling patterns become crucial. Changes in upwelling dynamics can disrupt marine ecosystems, affecting the distribution and availability of key species. This, in turn, can have cascading effects on the entire marine food web, potentially jeopardizing the food security of human populations that rely on marine resources. Therefore, in the broader context of climate change and biodiversity loss, acknowledging and addressing the impact of upwelling on marine ecosystems is important for sustaining fisheries, aquaculture, and overall marine biodiversity. Equally significant is

[12] European Committee of the Regions Repercussions of the Agri-Food Crisis at Local and Regional Level. http://www.cor.europa.eu

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a more in-depth analysis of *ocean oxygen depletion*, often termed as ocean deoxygenation. Characterized by a decrease in the dissolved oxygen content in seawater, lakes and river *oxygen depletion* cause profound implications for marine and freshwater life and fisheries. The explicit inclusion of this driver is instrumental in reinforcing the policy's stance on preserving robust marine ecosystems. Furthermore, an additional driver that necessitates further analysis is *ocean acidification*. This process, driven by the absorption of carbon dioxide from the atmosphere, can exert profound effects on marine life, particularly shell-forming organisms, and, by extension, on the entire marine food web. Its incorporation into the policy would fortify its focus on marine ecosystems and fisheries (Schickele et al., 2021). Furthermore, *rhizobacteria*, soil bacteria with the capacity to enhance plant growth and crop yield, often through improvements in nutrient availability, must find explicit mention. *Rhizobacteria* have the potential to play a significant role in advancing sustainable agricultural practices (Rabiey et al., 2017). Moving from drivers to indicators, which operate as critical measures for evaluating the impact and performance of agricultural practices, while the policy addresses water-related issues, an explicit remark of *water consumption* and *desalinated seawater use* is central for agriculture sustainability and would serve to accentuate the urgency of optimising water use, especially in an era when freshwater resources are becoming increasingly limited. The potential of desalinated seawater as an alternative for irrigation is gaining significance. Moreover, it is worth underlining that the incorporation of these drivers should be supported in the policy's specific context and objectives, substantiated by scientific evidence, and informed by stakeholder consultations. For instance, the work of Tai et al. (2019), which delves into the potential socioeconomic impacts of ocean acidification and climate change effects on Atlantic Canadian fisheries, underscored the significance of considering these factors in policy formulation. Similarly, the study conducted by Trnka et al. (2020), exploring the impacts of climate variability and vulnerability to climate change, offers valuable insights pertinent to the 'Farm to Fork' strategy. Paarlberg (2022) provided critical reflections on the European Union's F2F strategy, highlighting that the EU's F2F plan to expand organic farming, which is a key aspect of the strategy, is not as 'green' as it is perceived. It pointed out that the EU's rejection of genetically modified organisms (GMOs), an indicator lacking in the policy, and its intention to regulate gene-edited crops like GMOs are not in line with the 'green' vision. The author focuses on the EU's approach, which rules out both synthetic chemicals and modern biotechnology, may have damaging consequences, such as the need

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to convert more land to food production if organic farming is scaled up to replace conventional farming. It also suggested that Europe's regulatory example has discouraged the adoption of GMO food crops around the world and that its most recent aversion to agricultural science is less likely to enjoy global influence. Lastly, as stated by Schebesta et al. (2020), even if F2F Strategy is recognised as a significant step in European food policy making with the goal of creating a fair, healthy, and environmentally friendly food system, the success of the strategy depends on resolving key governance challenges and maintaining political *momentum* during implementation. The authors underlined that the strategy lacks a clear definition of 'food sustainability' or a 'sustainable food system', making it an ambiguous concept. The European Commission stressed the environmental, health, social, and economic benefits without providing specific boundaries. The broad interpretation of food sustainability poses a risk of policy incoherencies, as actions supporting one objective may hinder others. F2F's success depends on addressing substantive and institutional challenges, e.g. involving stakeholders to strengthen its social basis. Food democracy initiatives, such as food policy councils or citizen summits, are seen as promising for navigating conflicts of interest and values. The strategy's success depends on political support from the European Parliament and Council, reconciling opposing interests, considering the economic challenges following the COVID-19 pandemic.

4.2. Towards a resilient Agriculture: unifying efforts in EU Soil Policy Frameworks

The environmental and agricultural policies of the European Union are expressed through fundamental strategic documents: the Soil Monitoring Law, the EU Soil Strategy for 2030, and 'Ensuring availability and affordability of fertilisers' (COM(2022)590)[13]. The Directive on Soil Monitoring Law and Resilience (COM (2023) 416)[14], represents an ambitious directive

[13] European Commission. (2022). Communication COM/2022/590 final: Ensuring availability and affordability of fertilisers. Retrieved from https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A52022DC0590

[14] The European Parliament and the Council of the European Union. (2023). Communication COM/2023/416 final: Proposal for a Directive on Soil Monitoring and Resilience (Soil Monitoring Law). Retrieved from https://environment.ec.europa.eu/system/files/2023-07/Proposal%20for%20a%20DIRECTIVE%20OF%20THE%20EUROPEAN%20PARLIAMENT%20AND%20OF%20THE%20COUNCIL%20on%20Soil%20Monitoring%20and%20Resilience_COM_2023_416_final.pdf

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proposal with the primary goal of soil monitoring and resilience. Approved in July 2023 by the European Commission, with the aim of mitigating a broad spectrum of threats, including erosion, floods, loss of soil organic matter, contamination, and biodiversity loss. Its objective is to ensure soil health by 2050 through a legal framework that promotes the regeneration of degraded land and encourages sustainable soil management practices throughout the European Union. Simultaneously, the EU Soil Strategy for 2030, COM (2021) 699[15], focuses on the protection, restoration, and sustainable use of soil. Approved in November 2021, this strategy presents an action plan aiming to achieve healthy soils by 2050, with interim goals by 2030. The strategy addresses issues such as sustainable soil management, restoration of degraded land, desertification prevention, and increased soil research and monitoring activities. On the other hand, the communication on 'Ensuring availability and affordability of fertilisers' in 2022 focuses on optimising fertiliser use and reducing dependence on mineral fertilisers in the European Union. This communication from the European Commission aims to ensure the availability of affordable fertilisers, particularly in the context of rising energy and fertiliser prices, with specific attention to food security, reduction of nutrient losses, and maintaining soil fertility. In the present report, the inclusion of EU soil policy frameworks is essential, playing a central role in addressing food security, aligning with key overarching policies such as Farm to Fork (F2F), the Common Agricultural Policy (CAP), and the Green Deal. Recognizing the intrinsic connection between soil health and sustainable agriculture underscores the need to integrate soil policies, ensuring a comprehensive approach to achieving the broader goals outlined in these central EU strategies.

4.2.1. Introducing the EU Soil Policy frameworks

While the Soil Monitoring Law, the EU Soil Strategy for 2030, and the communication on Ensuring availability and affordability of fertilisers are distinct documents, they share intrinsic connections in the realm of sustainable soil management and agriculture in the European Union. The Soil Monitoring Law proposes a legal framework to monitor and address soil threats, emphasising the restoration of degraded land and sustainable soil management. The EU Soil Strategy for 2030 shares the goal of preserving and restoring

[15] European Commission. (2021). Communication COM/2021/699 final: EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate. Retrieved from https://www.horizon-europe.gouv.fr/sites/default/files/2021-11/strat-gie-europ-enne-pour-les-sols-2030-pdf-4963.pdf

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soils, presenting an action plan focused on promoting sustainable practices, restoring damaged land, and preventing desertification. Both strategies aim to ensure healthy and productive land by 2050. The policies highlight the importance of research, monitoring, and exchanging best practices to achieve common goals of soil health and food security. Furthermore, they focus on addressing common threats such as erosion, contamination, and biodiversity loss, promoting the adoption of sustainable agricultural practices and efficient resource management. The communication on 'Ensuring availability and affordability of fertilisers' connects to these strategies by addressing the issue of fertiliser availability and accessibility, emphasising the importance of efficient management of agricultural resources for food security and soil health. Optimising fertilisers use and reducing dependence on mineral fertilisers underscore the common interest in preserving soil fertility and mitigating nutrient losses, indirectly supporting overall soil health and environmental sustainability goals. These documents, therefore, integrate into a broader framework of policies aimed at soil protection, sustainable agriculture, and food security in the European Union, working synergistically to address common challenges and promote the adoption of sustainable agricultural practices for the future. However, within these policies lie gaps that demand attention for a more robust and holistic approach.

4.2.2. EU Soil Policy frameworks: unravelling the gaps and proposing data-driven enhancements for policy evolution

A detailed analysis across these directives unveils areas where inclusion could reinforce the effectiveness and impact of these strategies. One overlooked aspect of these policies concerns the role of *rhizobacteria* in promoting soil health. These microorganisms play a fundamental role in soil structure, nutrient retention, and plant growth. Integrating strategies that encourage the presence and action of rhizobacteria could improve agricultural practices, promoting soil resilience (Bhat et al. 2023). The composition of above-ground vegetation directly influences the structure of below-ground microbial communities and soil characteristics and *viceversa*. Soils with active microbial activity and strong connections between fauna and plants contribute to effective nutrient cycling, resistance to pathogens, and the overall well-being of crops. Additionally, they promote the long-term stability of ecosystems, especially considering global environmental changes. Numerous investigations have indicated that actively modifying plant root systems and soil microbial communities, either directly or indirectly, holds promise as a strategy to improve food crop yields, enhance their nutritional quality and

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safety, and deliver positive outcomes for both human and environmental well-being. LUCAS, which stands for the Land Use-Land Cover Area Frame Survey, involves the gathering of standardised data across Europe pertaining to land cover/land use (LC/LU), agro-environmental subjects, and soil (Figure 8). It is mentioned in the recent Soil monitoring Law Annex, highlighting the importance of considering both taxonomic and functional diversity in assessing soil health. LUCAS represents a comprehensive land monitoring initiative carried out by the European Union (EU). Its primary goal is to provide detailed and standardised data on land use and land cover within EU member states. LUCAS plays a fundamental role in comprehending the evolving patterns of land use and contributes significantly to different policy areas such as agriculture, environment, and regional development. The primary objective of LUCAS is to collect accurate, harmonised, and up-to-date information on land use and land cover within the EU. The survey is designed to support the implementation and monitoring of several EU policies related to agriculture, environment, and rural development. LUCAS employs a method of stratified random sampling. This involves categorising each EU member state into distinct strata based on geographical and land use features. Within each stratum, a random selection of points is made, and field surveyors then visit these points to gather relevant information. The survey includes information on land cover (e.g., forests, agricultural land, urban areas), land use (e.g., types of crops, farming practices), and other relevant features. One of the strengths of LUCAS is its commitment to harmonising data across EU member states, thus allowing for consistent and comparable information, facilitating the development of EU-level policies. Conducted at regular intervals, it employs a stratified random sampling approach, observing over 250.000 sample points. The LUCAS 2009/2012 extended the survey to include a topsoil component, analysing soil properties in 23 member states. The 2015 Soil Module revisited 90% of 2009 locations, expanded to cover all 28 EU member states, and added analyses on pH, organic carbon, nutrients, and electrical conductivity. The LUCAS 2018 introduces analyses of bulk density, soil biodiversity, visual assessment of erosion, and measurement of organic horizon thickness. All LUCAS data are freely available for download and have been utilised for various applications, including modelling, validation, and assessing ecosystem services. The continuous development of the LUCAS Soil database ensures its utility for diverse research fields. Statistics derived from LUCAS can be used in analysing and contributing to the advancement of various policy areas within the EU and data are valuable for tasks like land monitoring, spatial planning, and resource

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management, as exemplified by the *Copernicus earth observation program*. The European Soil Data Centre (ESDAC), hosted by the European Commission's Joint Research Centre (JRC), is the EU's primary source for standardised soil data and policy support. Established in 2006, ESDAC currently houses 88 datasets, 6000 maps, six atlases, 500 scientific publications, and extensive soil-related material. Through its data repository, ESDAC has licensed over 50,000 datasets, with 8500 in 2021 alone. The centre, with over 12,000 subscribed users, mainly from academia and research (75%), as well as public administration and the private sector (25%), aims to provide evidence for EU soil policies. As part of the European Union Soil Observatory (EUSO), ESDAC seeks to strengthen its role in supporting EU and regional policies (Panagos et al. 2022; Labouyrie et al. 2023) (Figure 8).

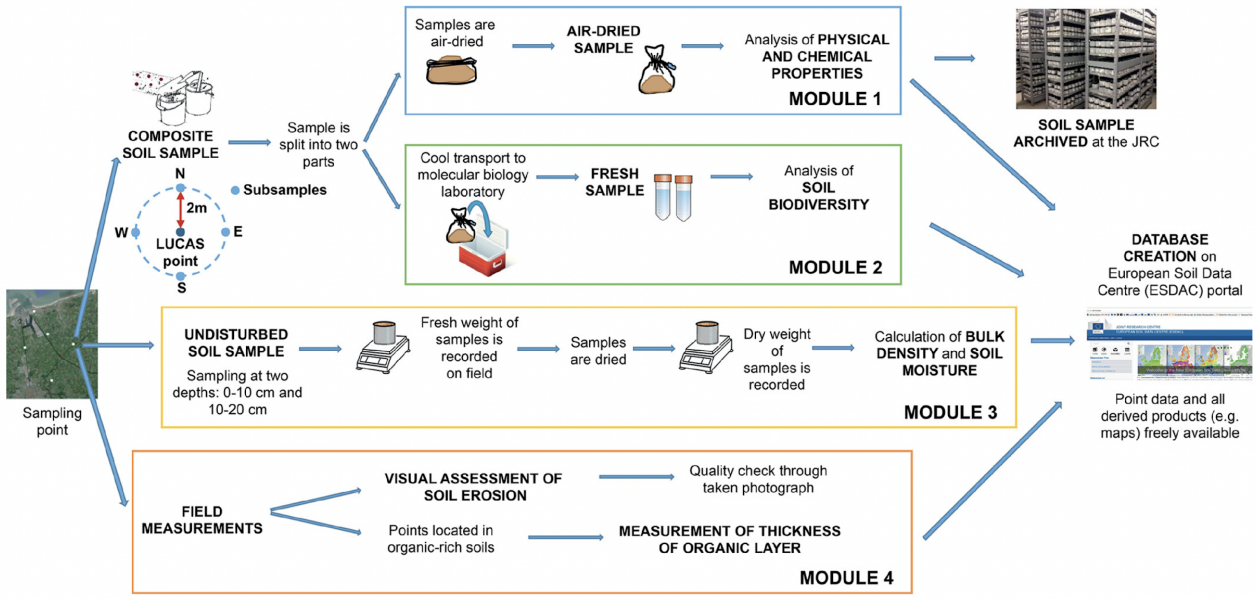

Figure 8: LUCAS Soil workflow from sampling to database generation (from https://esdac.jrc.ec.europa.eu/projects/lucas)

The study, the largest of its kind in Europe, also examined soil bacteria and fungi in various EU regions. It was reported that areas with higher biodiversity, often in disturbed areas like croplands and grasslands, may also host more potential plant pathogens. To effectively conserve soil microbial diversity, the study suggests actions on vegetation cover (e.g., rewilding) combined with soil management. This research will aid in the development of maps on soil biodiversity and indicators, supporting future soil conservation efforts. Understanding soil biodiversity is crucial for maintaining ecosystem services like food production and climate regulation. Studies, such as Rabiey et al. (2017), demonstrate the

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positive impact of certain microorganisms, such as *Piriformospora indica*, in increasing soil fertility and promoting plant growth. Integrating strategies to promote the presence and action of these microbial communities could enhance soil resilience and improve agricultural sustainability. Additionally, the application of *P. indica* has reduced the severity of *Fusarium* head blight by 70% and decreased the concentration of the mycotoxin by 70% and 80% in winter and spring wheat samples, respectively. *P. indica* has also increased above-ground biomass, 1000-grain weight, and total grain weight. These results suggest that integrating strategies to promote the presence and action of these microbial communities could enhance soil resilience and improve agricultural sustainability. Cornell University (Ithaca, NY, USA) developed the intensive laboratory-based Comprehensive Assessment of Soil Health (CASH) protocols, to assess the overall health of agricultural soils from a suite of selected soil physical, chemical, and biological properties and make best soil management recommendations based on the major soil health issues. A standard CASH comprises score for 12 health indicators: soil AWC (Available water capacity), surface hardness, subsurface hardness, wet aggregate stability, soil OM (Organic Matter), active C, soil respiration, protein index, soil pH, extractable P, extractable K, and extractable minor nutrients. The major constraints are specified when the health rating falls in the 'very low' (red colour) class. Through this tool, effective soil management practices can be recommended accordingly for improving cases with 'very low' soil health rating (Guo et al. 2021). Mhenni et al. (2021) explored drought characteristics and its effect on vegetation and agricultural productivity in three vegetation zones of Tunisia during the period 1982-2011. They used both meteorological drought and soil moisture indices, identifying the most appropriate index for each zone. The results revealed that meteorological droughts were short and frequent, triggering soil moisture droughts that were long-lasting and intense. The standardised precipitation index was identified as the best indicator of plant and agricultural drought in the North Forest, while the Palmer drought severity index was the best in the central steppe and the southern desert. Delayed correlation analysis revealed that the vegetation and wheat productivity response to droughts was more pronounced and had a significantly longer delay in the central steppe compared to other regions. An area requiring more attention concerns the implementation of climate change mitigation strategies in agricultural policies. Policies should align with practices that promote carbon sequestration in soils and the reduction of greenhouse gas emissions. The integration of these strategies would not only improve soil health but also contribute to

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climate change mitigation efforts. Toreti et al. (2020) highlighted how plant responses to increased atmospheric carbon dioxide (CO_2) concentrations, along with predicted variations in temperature and precipitation, will determine future agricultural production. They found that recent efforts have reduced uncertainties in crop responses induced by CO_2, thus eliminating simulations of climate change impacts that exclude CO_2. To address knowledge gaps and remaining uncertainties in estimating the effects of elevated CO_2 and climate change on crops, future research should expand experiments to more crop species in a broader range of growth conditions. This suggests that the integration of strategies that increase soil organic matter, as proposed by Toreti et al. (2020), could contribute to carbon sequestration, reducing greenhouse gas emissions. Integrating these strategies into soil policies would not only improve soil quality but also contribute to the fight against climate change. Soil nutrition is a fundamental element in ensuring sustainable agricultural yields and resilient crops. However, current soil policies often do not adequately focus on this aspect. The integration of specific goals and investments in soil nutrition could improve sustainable agricultural productivity. The study by Bright et al. (2017) examined the long-term intercropping of *Piliostigma reticulatum* in the Sahel, assessing crop productivity, carbon sequestration, nutrient cycling, and soil quality. *Piliostigma reticulatum*, a native woody shrub found in Sahel cultivated fields, has proven to enhance crop productivity and soil quality. In the study, implementing an intercropping system with the addition of shrub residues required four cultivation seasons to build soil organic carbon and alter soil nutrient status. This suggests that integrating strategies to increase soil organic matter, as proposed by Bright et al. (2017), could contribute to carbon sequestration, reducing greenhouse gas emissions. Incorporating these strategies into soil policies would not only improve soil quality but also contribute to the fight against climate change. The integration of these components into soil policies could promote sustainable agricultural management and preserving the environment. An integrated approach considering the presence of rhizobacteria, water resource management, climate change mitigation strategies, and soil nutrition could help the agricultural sector, promoting soil health and environmental resilience. The Soil Monitoring Law (COM/2023/416 final) marks a key progress toward fostering the health and resilience of soil across the European Union. Embedded within this directive are key policy recommendations that hold the potential to redefine our approach to soil management and conservation. Among these is the establishment of a comprehensive and uniform soil monitoring framework covering all EU territories. This

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initiative seeks not only to gather accurate and up-to-date data but also to drive measures for the regeneration of degraded soils. Moreover, the directive aims to elevate sustainable soil management to the standard practice within the EU. This involves a call for agricultural policies, advocating for progressive methods such as intercropping and the *integration of beneficial microorganisms* into cultivation practices. Recognizing the central role of healthy soils in carbon sequestration and the reduction of greenhouse gas emissions, the directive urges policies that actively promote practices fostering soil organic matter and carbon sequestration. Emphasis is also placed on the significance of soil nutrition in ensuring sustainable agricultural yields and resilient crops. Policies under this directive are expected to encourage the adoption of organic fertilisers and other practices geared towards enhancing soil nutrition[16]. The proposal for the EU Soil Monitoring Law in 2023, coupled with the EU Soil Strategy for 2030 and the 2022 policy ensuring the accessibility and affordability of fertilisers, share common aspects in their intent to address crucial challenges in agriculture and environmental sustainability within the European Union. Each proposal aims to establish a coherent or strategic framework to tackle soil and agriculture-related issues in the EU. Both the Soil Monitoring Law and the Soil Strategy for 2030 outline monitoring and assessment measures for soil health while allowing flexibility for member states to identify the best strategies adaptable to local conditions. These proposals have undergone impact assessments to evaluate their proportionality and long-term effectiveness. The Soil Monitoring law included a comprehensive impact assessment of nearly 1000 pages, addressing soil degradation from both scientific and economic perspectives. The effort was made to consolidate existing estimations of costs and benefits for both soil managers and society. Additionally, member states are mandated to establish a voluntary soil health certification, utilising data from the assessment. This certification empowers managers to evaluate the health of their soils, potentially enhancing the value of land and its produce. The market may recognize and reward products from healthy soils, with this certification working in tandem with carbon removal certification. Since soil conditions are very heterogeneous among and within each EU member state, the proposal emphasises the need for flexibility in defining administrative arrangements, organisation, and governance. While providing a framework to harmonize approaches, the intention is

[16] Publications Office of the European Union. (2022). The EU in 2021: General report on the activities of the European Union. Retrieved from https://op.europa.eu/en/publication-detail/-/publication/e3b89a5b-87c4-11ee-99ba-01aa75ed71a1/language-en

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not to impose strict prescriptions. Despite their intentions, all three policies have raised some concerns among stakeholders. Some believe that the necessary ambition is lacking to bring about effective positive changes. Criticisms include the need for significant improvement to ensure the effectiveness of the proposed measures and a perceived lack of motivation for real and concrete change. Nevertheless, this proposal has also generated concerns among some key actors, mainly regarding its impact on the agricultural sector and the potential for outsourcing production to countries with less stringent environmental regulations (Bagnall et al. 2023).

4.3. Connecting the dots: Unravelling the interplay of Biodiversity and EU environmental initiatives for Food Security

Several policies and initiatives related to biodiversity and the sustainable use of plant protection products are integral components of the European Union's commitment to environmental sustainability and biodiversity conservation. Among these, the sub screened policy in the present work are the *EU Pollinators Initiative*[17], the *EU Common Fisheries Policy*[18] [19], the *Convention on Biological Diversity*[20], *EU Biodiversity Strategy for 2030*[21], *Sustainable use of Plant Protection Products (Proposal for Regulation)*[22], and *The EU*

[17] European Commission. (2023). Communication COM/2023/35 final: Revision of the EU Pollinators Initiative. A new deal for pollinators. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A35%3AFIN&qid=1674555285177

[18] European Commission. (2023). Communication COM/2023/102 final: EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries. Retrieved from https://oceans-and-fisheries.ec.europa.eu/system/files/2023-02/COM-2023-102_en.pdf

[19] European Commission. (2023). Communication COM/2023/103 final: The common fisheries policy today and tomorrow: a Fisheries and Oceans Pact towards sustainable, science-based, innovative and inclusive fisheries management. Retrieved from https://oceans-and-fisheries.ec.europa.eu/system/files/2023-02/COM-2023-103_en.pdf

[20] United Nations. (2022). CBD/COP/DEC/23/15: Convention Biological Diversity 2022. Retrieved from https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf

[21] European Commission. (2020). Communication COM/2020/380 final: EU Biodiversity Strategy for 2030. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0380; https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

[22] European Commission. (2022). Communication COM/2022/305 final: Proposal for a Regulation on the sustainable use of plant protection products and amending Regulation (EU) 2021/2115. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0305

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Animal Health Law[23]. These policies are interconnected and share the common goal of ensuring environmental sustainability and biodiversity conservation. The *EU Pollinator Initiative* focuses on protecting and enhancing the status of pollinators, crucial for biodiversity and agriculture. Similarly, the EU Common Fisheries Policy and the Convention on Biological Diversity aim to ensure the sustainability of fishery resources and conserve biological diversity. Moreover, the EU Biodiversity Strategy for 2030 and the proposal for regulating the sustainable use of plant protection products underscore the importance of sustainable agricultural practices and integrated pest management to preserve biodiversity and ecosystems. Finally, the EU Animal Health Law contributes to animal health and well-being, influencing biodiversity and environmental sustainability. These policies address common environmental and agricultural challenges, such as biodiversity conservation, sustainable fisheries management, and the promotion of ecologically sustainable agricultural practices. Despite the targets set in the Biodiversity Strategy for 2020, which aimed to enhance the conservation status of 100% of habitats and 50% of species by 2020, the outcomes revealed that only 15% of habitats, 27% of species listed in the Habitats Directive, and 47% of species listed in the Birds Directive are currently in favourable conservation status[24]. The insufficient progress toward achieving biodiversity conservation targets is just one of the environmental challenges the EU faces. The impacts of global change on society, biodiversity, and ecosystem services are escalating, as noted by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in 2019. To address these challenges, the recently adopted Biodiversity Strategy for 2030 aims to 'Bring nature back into our lives', aligning with the Green Deal objectives. This strategy provides a comprehensive policy framework with specific goals and funding mechanisms. The Biodiversity Strategy for 2030 is built on three pillars: i) protecting and restoring nature in the EU by consolidating a cohesive network of protected areas and restoring degraded habitats, ii) establishing a new governance framework to ensure co-responsibility and co-ownership by all relevant actors, as well as new financial opportunities, and iii) adopting a global biodiversity agenda to increase the EU's

[23] European Parliament and the Council of the European Union. (2016). Regulation (EU) 2016/429: Transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law'). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0429

[24] European Commission. (2020). Commission Regulation (EU) 2022/720 of 10 May 2022 on the application of Article 101 (3) of the Treaty on the Functioning of the European Union to categories of vertical agreements and concerted practices (Text with EEA relevance). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0635

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contribution to halting global biodiversity loss and minimizing the eutrophication. In this context, key aspects for effective policy implementation are mainly the coordination within and among EU Member States, integration of biodiversity conservation into other sectors, sufficiency of funds, and governance and stakeholder participation (Hermoso et al. 2022).

4.3.1. Biodiversity Policy frameworks: unravelling the gaps and proposing data-driven enhancements for policy evolution

An integrated examination of these policies provides a comprehensive view of the challenges and opportunities associated with environmental sustainability and biodiversity. The EU Pollinator Initiative focuses on reversing the decline of wild pollinator populations by 2030. Given the estimated annual contribution of at least 5 billion euros to the EU's agricultural output, preserving pollinators is essential. However, the world is witnessing a dramatic loss of wild pollinators, posing threats to both human well-being and nature. Additionally, the Common Fisheries Policy of the European Commission aims for the long-term sustainability of fishing and aquaculture activities, ensuring food supply availability and a fair standard of living for fishing and aquaculture communities. This policy aligns with the European Green Deal, emphasising the triple contribution of fishing and aquaculture to coastal region economies, EU food security, and marine environment protection. The policy supports sustainability goals outlined in the European Green Deal, emphasising the importance of preserving marine resources for future generations. However, some issues need to be addressed. For example, in land-locked marine regions considered climate change hotspots, such as the eastern Mediterranean Sea, the current conservation objectives that concentrate on native species may soon become impractical. This is because many of these native species are anticipated to undergo local extinction or significant declines despite protection measures or face significant competition from invasive species. In such cases, it becomes fundamental for conservation policies to exhibit flexibility and adaptability, preparing for potential scenarios of biodiversity change. The emphasis should shift towards conserving ecosystem functioning, a goal that could be achieved by safeguarding unthreatened or even non-native species (Rilov et al. 2020). The European Union's F2F Strategy acts as a key initiative connecting agricultural and food policies with environmental sustainability and biodiversity. Protecting pollinators is essential for biodiversity and agriculture, contributing to the health of agricultural and natural ecosystems. Integrating the EU Pollinator Initiative into the F2F could ensure the

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promotion of sustainable farming practices and biodiversity conservation in line with the strategy's objectives. Moreover, the Common Fisheries Policy is closely linked to the F2F as it promotes sustainable fisheries management and the protection of marine ecosystems. Additionally, the Sustainable Use of Plant Protection Products aligns with the F2F as it aims to ensure that the use of plant protection products is sustainable, with such products being the last resort after considering alternative methods. The Common Fisheries Policy aims to ensure the long-term sustainability of fishing and aquaculture activities, preserving the socioeconomic fabric of coastal communities and contributing to the protection of the marine environment. The specific considerations on key drivers and indicators, such as *seafloor temperature*, *salinity*, *marine and freshwater biodiversity*, and *predator abundance*, would allow a holistic approach to marine resource management. The policy analysis underscores the necessity of integrating specific considerations regarding *nutritional quality of crops*, *insect abundance*, and *sustainable management of marine resources* to promote more effective management of marine ecosystems, fisheries resources, and agricultural practices. This integration can contribute to the conservation of biodiversity and environmental sustainability. Paul et al. (2021) focused on the analysis of vulnerability and the adoption of climate-resilient strategies for livelihood security and sustainable management of aquatic biodiversity in Lake Vembanad (India), offering a perspective on the impacts of climate change on a specific aquatic ecosystem and highlighting the importance of embracing adaptive strategies to preserve biodiversity and ensure the sustainability of aquatic resources. Furthermore, Pironon et al. (2019) explored potential compliant strategies for 29 crops in sub-Saharan Africa in response to future climate changes, providing important insights into possible adaptation strategies to preserve agricultural productivity and food security in the context of climate change. Another significant study by Pitman et al. (2021), highlighted how glacier retreat is creating new habitats for Pacific salmon in the western North America with a direct impact of climate change on marine habitat and fisheries resources. A comprehensive understanding of the impacts of climate change on nutritional quality is illustrated also by Alaerts et al. (2022): the study proposed how climate change is influencing the fragmentation of Florida stone crab communities, underscoring the importance of considering environmental impacts on marine species. Furthermore, Alves et al. (2017) examined the productive and reproductive performance, behaviour, and physiology of livestock under heat stress conditions, elucidating the direct impacts of climate change on agricultural productions

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and animal health. Báez et al. (2022) reported the effects of environmental conditions and jellyfish blooms on pelagic fish and fishing activities in the Western Mediterranean Sea, underlining the impacts of climate change on fishery resources and the fishing industry. The analysed policies need more considerations on drivers and indicators as the *nutritional quality of crops* and *insect abundance*. These two issues are closely interconnected and have a significant impact on agricultural sustainability and ecosystem health. The use of plant protection products can influence the nutritional quality of crops. Excessive fertiliser use can have a negative environmental impact and can also negatively influence the nutritional quality of crops. Therefore, it is important to consider the sustainable use of plant protection products and fertilisers to maintain the nutritional quality of crops. Insects play a crucial role in pollination, and many plant protection products can harm non-target insect species, potentially affecting crop yields. Additionally, the use of beneficial insects as *biopesticides* is becoming an increasingly popular strategy for pest control in a sustainable manner. This approach can help maintain insect abundance and promote biodiversity. The inclusion of comprehensive analysis regarding the nutritional quality of crops and insect abundance in policies can lead to more robust strategies for biodiversity conservation, soil health improvement, and the promotion of sustainable agriculture. The achievement of the ambitious objectives outlined in the biodiversity-related policy documents centres on the ability of EU Member States to strategically plan the implementation of conservation measures within constrained and uncertain budgets. Additionally, successful implementation requires improved engagement with the public and the prevention or resolution of potential conflicts with other socio-economic objectives and sectoral policies. All these efforts must be optimized amid the recovery from the adverse social and economic impacts of the COVID-19 pandemic. To efficiently implement policy such the Biodiversity Strategy for 2030, a crucial initial step involves recognizing the strengths and weaknesses of past biodiversity management experiences, identifying gaps, and building upon previous initiatives. Adequate planning is instrumental in addressing historical weaknesses in EU policy, such as the inadequate distribution of limited conservation funds, and conflicts between biodiversity conservation and other interests. The challenges posed by global change and its dynamic conditions necessitate adaptive biodiversity management (Rilov et al. 2020). Effectiveness in biodiversity conservation management requires adaptability to respond to these dynamic conditions. In certain cases, management beyond protected areas becomes essential to enhance the

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effectiveness and resilience of conservation efforts in the face of global change. Policy and funding mechanisms exist to support biodiversity management beyond protected areas, including the establishment of the future network of Green Infrastructures and High Nature Value Farming in agricultural land. However, past experiences underscore the need for careful planning in the implementation of these strategies to minimize potential conflicts with other sectoral interests. Improved integration of biodiversity conservation into other sectoral policies and funding mechanisms is crucial to overcoming past failures. Collaborative efforts, not only financial but also in terms of governance and multi-sector integration, are essential for achieving common goals. Without such collaboration, the future implementation of EU nature policy is at risk of repeating past mistakes and failures. Certain needs, not explicitly addressed in current policies, demand urgent attention to guide Europe towards biodiversity recovery and more sustainable development. This proactive approach could also reinforce the EU's role as a global leader in biodiversity conservation, setting an example for halting biodiversity loss in other regions worldwide amidst the global biodiversity crisis. This strong leadership is pivotal for shaping the international agenda in the coming decades, including the negotiation and implementation of new international agreements, such as the Convention on Biological Diversity, with the ultimate aim of halting biodiversity loss.

4.4. Addressing Food Security in the Context of Climate Change: Policy Measures

EU Climate policies collectively reflect the EU's commitment to facing climate change and promoting sustainability across various sectors, including greenhouse gas emissions, soil health, and nature restoration. The 2021_EU_COM_551[25] *Final system for greenhouse gas emission allowance trading within the Union* establishes a system for trading greenhouse gas emission allowances within the Union. This system aims to urgently counter climate change, aligning with the scientific findings of the Intergovernmental Panel on Climate Change (IPCC) Special Report (https://www.ipcc.ch). Similarly, the Climate Adaptation

[25] European Commission. (2021). Communication COM/2021/551 final: Establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0551

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Strategy[26] outlines how the European Union can adapt to the inevitable impacts of climate change and become climate-resilient by 2050. The strategy focuses on four main objectives: smarter adaptation, faster adaptation, more systemic adaptation, and intensifying international action for climate resilience. The 'Fit for 55'[27]: delivering the EU's 2030 Climate Target on the way to climate neutrality represents an interconnected package of proposals aiming to ensure a fair, competitive, and green transition by 2030 and beyond. Strengthening eight existing laws and introducing five new initiatives across climate, energy, fuels, transportation, buildings, land use, and forestry sectors. Additionally, the Climate Law establishes a framework to achieve climate neutrality within the EU by 2050. This law provides a comprehensive framework to enable efforts in mitigating climate change, including carbon removal, across the Union.

Addressing the 2030 objectives, the 2030 climate and energy framework[28] focuses on reducing greenhouse gas emissions, altering land use, and managing forestry to meet the climate and energy goals by 2030. Likewise, the Renewable energy (Legislation)[29] promotes the use of renewable energies to reduce greenhouse gas emissions and achieve the EU's climate and energy objectives. Moreover, the Circular Economy Action Plan[30] promotes a circular economy to reduce waste and advance sustainability, while the Nature restoration[31] policy emphasizes nature restoration to protect biodiversity and promote sustainability. Finally, both The future we want RIO United Nations[32] and THE 2030 AGENDA

[26] European Commission. (2021). Communication COM/2021/82 final: Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change. Retrieved from https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:52021DC0082

[27] European Commission. (2021). Communication COM/2021/550 final: 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0550&from=EN

[28] European Parliament and the Council of the European Union. (2018). Regulation (EU) 2018/841: Inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841

[29] European Parliament and the Council of the European Union. (2018). Regulation (EU) 2018/2001: Promotion of the use of energy from renewable sources. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001

[30] European Commission. (2020). Communication COM/2020/98 final: A new Circular Economy Action Plan For a cleaner and more competitive Europe. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN

[31] European Commission. (2022). Communication COM/2022/304 final: Proposal for a Regulation on nature restoration. Retrieved from https://environment.ec.europa.eu/system/files/2022-06/Proposal%20for%20a%20Regulation%20on%20nature%20restoration.pdf

[32] European Commission. (2013). Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the

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FOR SUSTAINABLE DEVELOPMENT[33] by the United Nations outline sustainable development goals for the future and for 2030, highlighting the collective commitment to sustainability in various sectors, including reducing greenhouse gas emissions, preserving soil health, and promoting nature restoration. Together, these policies reflect the EU's global commitment to a more sustainable and resilient future. The policies demonstrate the European Union's decisive commitment to preventing climate change and promoting sustainability in various crucial areas. These policies vary in specific objectives and adopt approaches but share a fundamental intent: addressing climate change and steering towards a sustainable future. For instance, the Final system for greenhouse gas emission allowance trading within the Union focuses on greenhouse gas emission allowances, aiming to urgently counter climate change in alignment with the scientific findings of the IPCC's Special Report[34].

4.4.1. Climate change Policy frameworks: unravelling the gaps and proposing data-driven enhancements for policy evolution

A thorough analysis of these policies may reveal further areas of convergence and divergence, enabling the development of more comprehensive and synergistic strategies to address complex environmental challenges. Examining the various policies related to climate change, agricultural and food sustainability, environmental conservation, and natural resources, it becomes apparent that there are areas where these policies can be enhanced and strengthened. In several policies such as the Circular Economy Action Plan and Renewable energy (Legislation), key aspects related to agricultural and food sustainability have not been thoroughly addressed. For instance, *precision Farming* which employs advanced technologies like GPS and data analysis to optimize agricultural production while reducing environmental impacts, hasn't been thoroughly addressed. This practice could play a crucial role in promoting more efficient and sustainable agricultural systems. Additionally, a detailed analysis of the *nutritional value* of agricultural products and the integration of *crop wild relatives* (wild species genetically linked to crops) have not received enough attention. These elements are essential for improving food quality

limits of our planet'. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013D1386

[33] United Nations. 'Transforming Our World: The 2030 Agenda for Sustainable Development', 2015. Retrieved from https://eur-lex.europa.eu/EN/legal-content/glossary/sustainable-development-goals.html

[34] Intergovernmental Panel on Climate Change. (2023). IPCC — Intergovernmental Panel on Climate Change. Retrieved from https://www.ipcc.ch

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and developing crop varieties resilient and adaptable to changing environmental conditions. Implementing more sustainable agricultural policies requires a comprehensive approach that includes responsible use of fertilisers and pesticides, optimal soil management, and promotion of agricultural practices preserving biodiversity and soil fertility. The policies examined exhibit gaps in natural resource management and biodiversity conservation. Indicators like *insect abundance*, *carbon cycle*, and *water consumption* have not been sufficiently focussed. These aspects are fundamental for sustainable natural resource management and ecosystem preservation. Particularly, the lack of insights into insect abundance and their vital role in ecosystems could compromise accurate assessment of ecosystem health. The *carbon cycle*, representing the interconnection between carbon emissions and absorption in the environment, is crucial to understand the impact of human activities on climate change and environmental stability. Furthermore, the lack of a detailed focus on *water consumption*, sustained by robust data and early warning measures to be adopted, concerning responsible water resource use, is crucial to ensure water resource sustainability and aquatic ecosystem conservation. Integrating these considerations into policies would be essential to adopt a more comprehensive and responsible approach towards natural resource and environmental management. The analysis of various policies clearly indicates the need for a more interconnected and comprehensive approach to address sustainable development challenges. By bridging the gaps identified in different policies, there's a priority to integrate strategies to combat climate change, promote sustainable agricultural practices, and conserve natural resources. By more deeply integrating key themes such as water resource management, conservation of insect biodiversity, and monitoring the carbon cycle, a more comprehensive framework could be outlined to address global challenges related to sustainable development. Precision Farming, exemplified in Zhang and Kovacs (2012), underscores the transformative potential of advanced technologies, such as GPS and data analytics, in revolutionizing agricultural efficiency while minimizing ecological footprints. The policies' missed opportunity to explicitly integrate Precision Farming techniques represents a substantial setback in fortifying agricultural sustainability and environmental scrupulousness. A deeper delve into agricultural sustainability exposes the oversight of crucial facets highlighted in Castañeda-Álvarez et al. (2016). This study articulates the importance of *nutritional value* in agricultural produce and advocates for leveraging *Crop Wild Relatives* to fortify crops against environmental adversities. Hallmann

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et al. (2017), Galloway et al. (2004), and Vörösmarty et al. (2010) underscored the indispensable roles played by *insect abundance*, the *carbon and nitrogen cycle*, and *water consumption*, respectively, in sustaining ecosystem health, managing climate change impacts, and preserving water resources. Climate Adaptation Strategy seeks smarter, faster, and more systemic adaptation to climate change, while 'Fit for 55' initiatives converge towards an equitable, competitive, and green transition by 2030. Similarly, the proposed greenhouse gas emission trading system aims to efficiently reduce emissions and contribute to limiting global warming. Simultaneously, directives on renewable energies and circular economy action plans serve as fundamental pillars of the European Green Deal. Their goal is to scale up the circular economy, reduce resource consumption, and decisively contribute to achieving climate neutrality by 2050. These policies and strategies don't function in isolation; they are interconnected. Legislative proposals are linked to IPCC reports, emphasizing the existential threat posed by climate change and the need for multidimensional approaches. Moreover, the 2030 Agenda for Sustainable Development, adopted by all UN Member States, represents a global commitment to eradicating poverty and achieving sustainable development by 2030. This integrated framework of policies is based on the 17 Sustainable Development Goals (SDGs), integrating economic, social, and environmental dimensions. The impact assessments also highlighted the necessity of continued implementation, monitoring, and, if required, refinement of existing policies. This convergence of policies, grounded in scientific evaluations and global commitments, forms a holistic framework necessary to address the urgent challenges of climate change, resource depletion, and sustainable development. The integration of these policies fuels hopes for a future characterized by resilience, equity, and environmental preservation.

4.5. Scoping Group Activity

As explained previously, one of the objectives of Task 1.2 was the qualitative involvement of external European policy actors and to integrate their feedback into the project activities (especially WP1 and WP5). At this regard an *ad hoc* 'Scoping Group' was established by ENEA with the contribution of the partners to initiate a consultation process aimed at the following objectives:

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- to decide on the most suitable knowledge synthesis method(s) to best link data and knowledge with policy needs.
- to create the conditions for a continuous liaising between ECO-READY project and a group of selected external stakeholders during the entire course of the project lifetime.

As such, in view of the first annual ECO-READY meeting in Rome, WP1 Committee and Executive Board organised the first Scoping Group activity led by ENEA.

During the preparation process the following scheme was elaborated:

1. To identify types of policy makers to be involved

2. To select potential policy makers to be invited

3. To clarify which output has to come up after the meeting (Proceedings, Report, Checklist/grid etc)

4. To define contribution and role of the policy makers concerned as well as way of moderation (*i.e.* as option 1, to agree which type of documents will/can be provided before the meeting to the policy makers or, as option 2, to anticipate prior to the meeting a series of key questions to raise during the discussion)

5. To evaluate role of other partners

6. To arrange logistic info and to prepare Agenda of the roundtable

In order to ensure wide participation and multiactor approach it was decided to select European policy actors representing International/National/Local policy makers from public sector, Representatives from EU DGs, Policy makers from EU food industry, farmers, consumers, regions/cities/territories Associations as well as environmental NGOs and Think Thank. Finally, it was retained useful to invite also agri-food farmers/entrepreneurs and consultants working for EU agencies or lobbies.

Before the meeting, ENEA as moderator of the Scoping Group provided the invited external policy actors with pertinent information on the project as well as shared the potential questions to reply during the round-table discussion.

Thus, on 6th December in Rome, the Scoping Group was held in hybrid mode with the participation in presence of six experts and online of eight experts. In short, the matter of

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drivers and data as a basis for the development of European policies is far from being considered simple or obvious since there are many factors to take into account. From the discussion it emerged that the plurality of stakeholders involved in the policies determined a plurality of drivers and data that are taken as reference; therefore, according to the feedback of the policy actors it is extremely important that each stakeholder won't be excluded or less considered than others in this debate, so that everyone is able to clearly represent which are the actual drivers or datasets that must be considered by the European legislator (EU Regulations and Directives). Further details have been summarised in the next paragraph (4.5.1).

4.5.1. Minutes and conference proceedings of the scoping group activity

Objective of the Scoping Group activity

As part of the Task 1.2 the Scoping Group activity wanted to ensure coherence between the data collected in Task 1.1. and list of policies elaborated in D1.2 by better clearing link between data and policies. In order to achieve this objective, the Scoping Group set up an effective engagement and dialogue with key policy actors, facilitated by ENEA to feed their knowledge and advise into the data-policy link concerning Food Security (FS), Biodiversity (BD), Climate change (CC) and European Policies including CAP and the Green Deal (D1.2).

Rationale used

In order to comply with the objective of the Scoping Group ENEA, as task leader, preliminarily defined the following master plan:

1. To identify **type** of policy makers to be involved
2. To select **list** of potential policy makers to be invited
3. To clarify **which output** has to come up after the meeting (Proceedings, Report, Checklist/grid etc)
4. To define **contribution and role** of the policy makers concerned as well as way of moderation *(i.e. as option 1 to agree which type of documents will/can be provided **before the meeting** to the policy makers/ or as option 2 to anticipate prior to the meeting a series of **key questions** to raise during the discussion)*

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5. To evaluate **role** of other partners
6. To arrange **logistic** info and to prepare **Agenda** of the round-table

After discussing thoroughly with the partners concerned it was decided to involve and invite the following policy actors:

- International/National/Local policy makers from public sector
- Representatives from EU DGs
- Policy makers from EU food industry association
- Policy makers from EU farmers association
- Policy makers from EU consumers association
- Policy makers from EU organization representing territories
- EU/National/Local stakeholders' platforms & Think Thank
- Agri-food companies/entrepreneurs
- Experts/Consultants working for EU agencies/lobby
- *external Advisory Board members*

Therefore, taking advantage of the project meeting which was held in Rome ENEA organised a round-table discussion in a form of hybrid event to meet the policy actors and get their feedback, according the following agenda:

General Agenda

- **DATE**: 6th December 2023
- **TIME**: 11.15 h – 13:00 h (CET)
- **PARTICIPANTS**: six in presence and seven online

- **AGENDA**
  - 11:15 – 11:30: **Opening and introduction** to the round-table
  - 11:30 – 12:15: "1st Q&A" on **data & drivers**
  - 12:15 – 13:00: "2nd Q&A" on **ECO-READY research lines**

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In particular, in order to prepare before the meeting the two sessions ENEA negotiated with the policy actors concerned the following key statements and corresponding key questions:

TOPICS AND KEY QUESTIONS OF THE ROUND TABLE

- 11:15 – 11:30: Opening and introduction to the round-table
  - *Each policy actor present the organization and the main expertise* ***in 1 minute***

- 11:30 – 12:15: "1st Q&A" on **drivers and data**
- Statement from the moderator: "*Currently specific drivers are identified and used by EU policy makers in concerning climate change, biodiversity, food security and CAP fields. Upon this, different data (data sets, data sources, data platforms) are used to monitor the drivers and their nature is important because they can affect or influence both policy makers understanding and agrifood operators' interests".*
- *Questions to each expert:* **"According to your experience and expertise in your organization, how drivers and data should orient the EU related policies? Is there a need to introduce any improvements to the analysis and policy making process? Are there any practical examples and/or lesson learnt would you like share?"**

in 4-5 minutes

and

TOPICS AND KEY QUESTIONS OF THE ROUND TABLE

- 12:15 – 13:00: "2nd Q&A" on **ECO-READY research lines**
- Statement from the moderator: "*As introduced during the morning session and as reported in the Executive Summary of Structured Data Review on Climate change, biodiversity and food security nexus it seems that important drivers for food security from climate change and biodiversity are well recognized, and sufficient efforts have been put in place to report and monitor those drivers".*
- *Questions to each expert: "***According to your experience and expertise in your organization, do you think drivers and data identified in the ECO-READY report are relevant or do you retain are there any gaps to fill? How agrifood operators and stakeholders could contribute to raise/credit pertinent drivers and data to increase policy making capacity and to better engage/empower food systems actors?"**

- ***in 4-5 minutes***

On 6th December 14 experts attended the meeting partially in presence and remotely. The list is the following:

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LIST OF POLICY ACTORS CONFIRMED

1. Carlo Hausmann – AgroCamera (#regional #agribusiness) – in presence
2. Gaetano Zarlenga – CUEIM (#GreenGrowth #ResearchToBusiness) – in presence
3. Daniele Rossi – Copacogeca (#Eufarmers) – in presence
4. Giovanni Gioia – ANGA (#young farmers #entrepreneurship) – in presence
5. Valentina Massa – EFFPA & Dalma Mangimi (#EU association #animal feeding #entrepreneur) – in presence
6. Michele Contel – Assobirra (#beer industry #young alcol) – in presence
7. Francesco Lembo – ACR + (#Eurocities #Euroregions) - ONLINE
8. Roberta Mancia – ThinkE (#EUlobby #training) - ONLINE
9. Paolo Patruno – CLITRAVI (#EU meat producer #EUlabelling) - ONLINE
10. Marianna Faraldi – TECNOALIMENTI (#food industry #digitalisation) - ONLINE
11. Giulia Riedo – WWF (#EU environment #NGO) - ONLINE
12. Marilda Dhaskali – BirdLife (#EU environment #NGO) - ONLINE
13. Luigi Tozzi – SAFE (#EU Consumers) - ONLINE
14. Germana Di Falco - Presidenza del Consiglio dei Ministri (#NRRP, #cohesion, #public) – ONLINE

Main proceedings

As a general outcome the issue of drivers and data that are the basis of European policies is far from being considered easy and obvious because according to the feedback collected by the policy actors, that there are many factors to consider. From the discussion it emerged that the plurality of stakeholders involved in the policies determined an equally plurality of drivers and data that are taken as reference, therefore in their opinion it is extremely important that each stakeholder is not excluded or less considered than others in this debate, so that everyone is able to clearly represent which are the actual drivers or datasets that must be subject to due evaluation by the European legislator (in this case of the EU, mainly dealing with EU Regulations and Directives).

The following minutes were summarised:

- The relation between data/drivers and policies addressing food security is crucial because it can have also an impact on the use of the funds allocated for the closing programming period 2014-2020 and for the future cohesion policy post 2027 and the new multi annual financial framework.
- It is important to collect several qualitative data, but also to identify the drivers and the challenges for focusing on the best way the concentration of the EU budget and of national budget.

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- Food security drivers could represent a very critical dimension to highlight the fragility of territories and as an indicator to identify how to concentrate significant resource.
- There is the need to have more data to support an evidence-based policy and to share knowledge about the drivers that will affect food security also to localize future food security policies it would be important to have a sort of scaling of data at the local level, regional level, national levels.
- Progress creates new situations, sometimes unfavourable, such as the cost of energy, but sometimes favourable, such as the increasing direct sales phenomena that occurred during the pandemic. Businesses, but also political decision makers, do not have sufficient knowledge of the dimension of this phenomenon and therefore are not able to guide territorial policies. For example, market data and drivers must be closely linked to production potential. We need to understand which production needs to be developed, which ones will be easier to sell, which ones will give greater economic reward, which ones will be the most suitable to be protected by trademarks.
- There are some limitations concerning data which are collected because, somehow, there are different definitions and different methodologies of collecting data and this aspect can create some misunderstanding for policymakers.
- Some data seems overlooked with respect others, such as those referred only to the production, while some same data seem not aligned when they are used to formulate policies related CAP, healthy diets and consumption and in terms of timelines.
- Especially for the CAP measures there is the need to have more primary data from agri-food farmers which can be used to create sort of “ecosystem” datasets as primary repository for the formulation of the future policies under F2F, Green Deal etc.
- The contribution from Blue Economy and Fisheries, as fast-growing sectors seems still under considered but it can deliver data regarding decarbonisation and nutritional policies.
- There is still a low involvement from the private sector because some data are not compulsory for their collection at company level. This is also originated by a lack of

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trust from private operators towards local Governments and EU institutions. For example, in the case of Waste Framework Directive.

- The nature of data should be reconsidered not only as primary number but also as means of transformation for the food systems.
- Data and drivers should well ensure fair transition to sustainability for all the agri-food sectors also by establishing fair and well recognised metrics and footprint calculations methods.
- The scientific approach concerning data and drivers review should be better linked to economic growth variables also including the role and the impact from/on the local territories. At this regard, a series of thematic/horizontal group of data should be filtered and prioritized despite having too many fragmented data.
- Lower consideration and involvement into the political process seems to be assigned to agri-food EU farmers. If data and drivers used to formulate legislative policies are deriving only from a top-down analysis there is a concrete risk to not allow farmers to reach the envisaged targets.

Below some photos of the scoping group session during the ECO-READY Annual Consortium Meeting (December 06-07, 2023 ENEA Headquarters Lungotevere Thaon di Revel, 76 - Rome, Italy)

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5. Conclusions

The present study aimed at connecting data with the CAP, Green Deal, and other European Commission Frameworks & Policies, with a primary focus on ensuring relevance to Food Security (FS), Biodiversity (BD), and Climate Change (CC) objectives. Employing appropriate methods of knowledge synthesis, the analysis of screened policies was complemented by an assessment of gaps, considering crucial drivers and indicators within the realms of environmental and agri-food policy. The scientific literature analysis served to establish connections between the data and the screened policies. Considering the gaps and the challenges that our agri-food system is facing, the synthesized findings suggest the urgent need for real-time and early warning monitoring tools for food security, along with scenario models that account for the complexity of technical, economic, and social conditions, going beyond general objectives to consider tailored solutions. Recognizing drivers and indicators as key concepts, the results encourage landscape-specific approaches to maximize biodiversity gains from agricultural practices, mitigate climate change effects and assuring food security. For example, the promotion of remote sensing technologies, exemplified by Copernicus Sentinel-2 data, is crucial for enhancing the monitoring of agricultural activities. Moreover, it is important to underscore the significance of emerging ICT technologies, such as the Internet of Things (IoT), Artificial Intelligence (AI), and Cloud Computing, in facilitating real-time information exchange throughout the farm-to-fork value chain. This aligns remarkably well with the project's objective to develop an Observatory platform, a real-time surveillance system that consolidates comprehensive information and data related to the impact of climate change and biodiversity on shaping food security. The call to action includes the promotion of green infrastructure implementation and an increased focus on the ‘one health’ concept. Addressing issues related to food security within the context of climate change and biodiversity loss, considering factors like poverty, war, and post-pandemic challenges, is essential. While acknowledging the pivotal role of large-scale farmers, also the scoping group activity emphasized the equal consideration of the needs of small farmers farmers to ensure inclusive and sustainable agricultural practices. In Task 1.2, the Scoping Group aimed to establish coherence between the data gathered in Task 1.1 and the policies outlined in D1.2 by enhancing the clear linkage between the collected data and the list of

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policies. From the Scoping group activity emerged that the relationship between data/drivers and food security policies is crucial for allocating funds in the closing programming period (2014-2020) and future cohesion policies post-2027. Collecting qualitative data and identifying drivers and challenges are essential for optimizing EU and national budgets. Food security drivers can highlight territorial fragility, necessitating a focus on resource concentration. Challenges include the need for more localized, diverse data, overcoming limitations in data definitions and methodologies, involving the private sector, and linking scientific approaches to economic growth variables for a fair transition to sustainable agri-food sectors. Table 5 outlines the principal findings and conclusions of this document, summarizing the gaps and proposing potential 'call to action' measures.

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Table 5: Overview of the main findings and conclusions, outlining identified gaps and suggesting potential 'call to action' initiatives

	Key Findings	Gaps and proposing data-driven enhancements	Call to Action
Pillars of Resilience: Green Deal, F2F, and CAP policy ensuring Food Security in a changing climate and biodiversity loss threat context	The Green Deal, CAP, and F2F strategies promote sustainable and resilient food systems, fair remuneration for farmers, organic farming, pesticide use reduction, and greenhouse gas emissions reduction. They also set ambitious targets for environmental sustainability and incorporate eco-schemes to incentivize environmentally friendly farming practices.	The strategies may benefit from a more comprehensive exploration of the integration of animal welfare and antibiotics legislation, ensuring data quality, and providing clarity on eco-schemes. Additionally, there is an opportunity for a deeper discussion regarding the implications of climate change on marine food systems, the effects of upwelling on marine ecosystems, ocean deoxygenation, and ocean acidification. Thematic aspects such as water consumption, the use of desalinated seawater, and the role of microorganisms (e.g. rhizobacteria) in sustainable agriculture could be further elaborated upon.	The strategies should incorporate the missing drivers and indicators based on the specific context and objectives of the policy, supported by scientific evidence and stakeholder consultation. They should also adopt a common data approach and cooperation between Member States and the Commission to ensure data quality for monitoring and evaluation. The strategies should also elaborate a precise strategy related to the potential implications of organic farming on the spread of antibiotic resistance.
Towards a resilient Agriculture: unifying efforts in EU Soil Policy Frameworks	The Soil policies, including the Soil Monitoring Law, the EU Soil Strategy for 2030, and the communication on 'Ensuring availability and affordability of fertilisers', aim to address soil health, sustainable agriculture, and food security. They promote soil monitoring, restoration of degraded land, sustainable soil management, and efficient use of fertilisers. They also set ambitious targets for soil health by 2050 and incorporate measures to mitigate threats such as erosion, contamination, and biodiversity loss	The policies need to further explore the role of microorganism such as rhizobacteria in promoting soil health, the impact of climate change on agricultural productivity, and the importance of soil nutrition in ensuring sustainable agricultural yields. The water resource management and the potential of practices such as intercropping and the integration of beneficial microorganisms into cultivation practices require a precise and harmonized rationalisation for their application.	The policies should incorporate the missing components based on the specific context and objectives of the policy, supported by scientific evidence and stakeholder consultation. They should also adopt a common data approach and cooperation between Member States and the Commission to ensure data quality for monitoring and evaluation. The policies should also consider the potential implications of climate change on agricultural productivity and the importance of soil nutrition in ensuring sustainable agricultural yields. It is necessary, on one hand, to harmonize monitoring strategies, and on the other hand, to plan targeted actions considering the European soil heterogeneity.

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	Key Findings	Gaps and proposing data-driven enhancements	Call to Action
Connecting the dots: Unravelling the interplay of Biodiversity and EU environmental initiatives for Food Security	The biodiversity policies, including the EU Pollinators Initiative, the EU Common Fisheries Policy, the Convention on Biological Diversity, EU Biodiversity Strategy for 2030, and the Sustainable use of Plant Protection Products, aim to address environmental sustainability and biodiversity conservation. They promote the protection of pollinators, sustainable fisheries management, conservation of biological diversity, sustainable agricultural practices, and integrated pest management. They also set ambitious targets for biodiversity conservation.	The policies might benefit from a more comprehensive exploration of the intricate connections between climate change and agricultural productivity, as well as a deeper consideration of the nutritional quality of crops and the role of insects. Moreover, there is an opportunity for a more extensive discussion on the broader implications of global change, encompassing its societal impact, effects on biodiversity, and implications for ecosystem services. Exploring the potential of environmentally sustainable practices, such as the judicious use of plant protection products and fertilizers, along with the promotion of beneficial insects as biopesticides, could further enhance the policies. The policy analysis underscores the necessity of integrating specific considerations regarding nutritional quality of crops, insect abundance, and sustainable management of marine resources to promote more effective management of marine ecosystems, fisheries resources, and agricultural practices.	The policies should incorporate the missing components based on the specific context and objectives of the policy, supported by scientific evidence and stakeholder consultation. They should also adopt a common data approach and cooperation between Member States and the Commission to ensure data quality for monitoring and evaluation. The policies should also consider the potential implications of climate change on agricultural productivity and the importance of nutritional quality of crops and insect abundance in ensuring sustainable agricultural yields.
Addressing Food Security in the Context of Climate Change: Policy Measures	The EU has established a suite of policies aimed at promoting sustainability and combating climate change. These include the 'Fit for 55' package for a green transition by 2030, the Climate Law for achieving climate neutrality by 2050, the 2030 climate and energy framework to reduce emissions, renewable energy legislation, the Circular Economy Action Plan, and the Nature restoration policy. These efforts align with the 17 Sustainable Development Goals (SDGs) and are supported by the Climate Adaptation Strategy.	While the existing policies offer a comprehensive framework, there is a need for further exploration to ensure their effectiveness. Notably, attention should be directed towards achieving the 55% emissions reduction target by 2030. Additionally, a more in-depth focus on precision farming, crop wild relatives, insect abundance, the carbon cycle, water consumption, and broader gaps in natural resource management and biodiversity conservation is necessary. This approach will strengthen the policies, addressing potential shortcomings and fostering a more sustainable agricultural future.	To address these gaps, there is a need to integrate strategies that encompass climate change mitigation, sustainable agriculture, and natural resource conservation. This includes a focus on water resource management, insect biodiversity, carbon cycle monitoring, and the explicit integration of Precision Farming techniques. Additionally, there is a call to address planning to hit climate targets and to increase climate finance and update strategies for the net zero target.

General conclusions:

- Need of tailored solutions that consider technical, economic, and social conditions, with a focus on real-time monitoring for food security. Landscape-specific approaches, incorporating technologies like remote sensing, IoT, AI, and Cloud Computing, are encouraged to maximize biodiversity gains, mitigate climate change effects, and ensure food security. The development of an Observatory platform aligns with these objectives, aiming to consolidate information on climate change, biodiversity, and food security.
- The call to action includes promoting green infrastructure, embracing the 'one health' concept, and addressing issues like poverty and post-pandemic challenges.
- Importance of considering both large and small-scale farmers for inclusive and sustainable agricultural practices.
- The Scoping Group's role involved establishing coherence between data and policies, recognizing the crucial link between data/drivers and food security policies for effective fund allocation in current and future programming periods.
- Collecting qualitative data, identifying drivers, and overcoming challenges are deemed essential for optimizing EU and national budgets in the pursuit of sustainable agri-food sector.

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Annex 1: Topic classification of the EU policy documents

This annex describes the methodology and the detailed outputs which have been followed in order to classify the formal EU policy documents into a more synthetic set of topics with policy relevance (see Table 5).

This synthetic mapping allows to get a grasp on the entire corpus of policy documents and can support more detailed analysis of the documents from each topic facilitating the establishment of connections with domains of scientific expertise without losing the interdependencies between policy topics and the respective documents.

Methodology

The methodology follows a clustering approach which employs similarity criteria between documents derived from Eur-Lex meta-data 'directory code'. EUR-Lex adopts a hierarchical classification of the legal documents into directories, which allows to relate documents on the base of parenthood relationships across the directory graph.

As a preliminary step the documents within the EU legislation domain with legal types of REG, DIR or COM have been selected and for each of them the corresponding directory codes have been extracted from the EUR-Lex database. This resulted in the selection of 78 documents.

The first step consisted in the identification of the distinct EUR-Lex directory codes and their mapping into coded topics which reflect the EUR-Lex hierarchical structure. Some of the directory codes associated with single documents and belonging to the same EUR-Lex branch have been grouped into a single code at this step. This step resulted in grouping the documents into 35 coded topics directly matching the policy topics and structure of the EUR-Lex directories.

In the second step the coded topics have been mapped into a concise set of interpretable topics from the perspective of scientists by screening the titles of all documents and the summary metadata available in the EUR-Lex repository as well as clustering the documents on the base of the parenthood relationships deriving from the EUR-Lex directory codes. Three types of relationships (child-parent, sibling and set membership) have been

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combined with the document screening resulting into the identification of 14 policy topics with relevance for the science-policy interface.

They can be reduced further by excluding obsolete documents (e.g. legislation not anymore in use or documents not related to science or data produced by scientists) and by further grouping related topics containing few items.

Results

Table 6 contains the output of the first step (note that for convenience in handling the documents in chronological order the formal document codes have been reshuffled in order to have the year appearing on the first place, while keeping all the rest of the information necessary to reference the documents). In total there are 35 coded topics, which form a forest composed by 11 stand-alone trees (first number in the topic code ranging from 1 to 11). The nodes of these trees represent sets of documents associated with the corresponding EUR-Lex directories. Sub-directories of a directory coded as a node X are coded by the notation *X.n*. The roots are coded by a number from 1 to 11 and often but not always they correspond to a root directory of EUR-Lex. For examples the root EUR-Lex directory 'Environment, consumers and Health Protection' have been splitted into two trees with roots '1. ENV' and '2. CONS' standing for 'Environment' and 'Consumers' respectively. Note also that not all coded roots are included in the table. This is due to the lack of documents included in the repository included in the root coded topic or because the respective code topics can be connected with data obtained through rather different scientific methodologies. This is the case of the tree with root '2 CONS', for which only the child nodes 2.1, 2.2 and 2.3, corresponding respectively to legislation about consumer information, protection of economic interests of consumers and food safety have been included.

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Table 6.

Coded topic	EUR-LEX Directory - full path name	Documents
1. ENV	Environment, consumers and Health Protection /Environment	2022_EU_COM_304_final 2021_EU_COM_699_final
1.1. ENV_GEN	Environment, consumers and Health Protection /Environment/General Provisions and Programmes	2022_EU_COM_305_final 2021_EU_COM_082_final 2020_EU_COM_380_final 2020_EU_COM_098_final 2013_EU_DEC_1386 2013_EU_COM_0249_final 2008_EU_DIR_0056
1.2.1 ENV_P_H2O	Environment, consumers and Health Protection /Environment/ Pollution and nuisances /Water Protection and Management	2023_EU_COM_102_final 2008_EU_DIR_0056 2019_EU_DIR_0904
1.2.2 ENV_P_ATMmon	Environment, consumers and Health Protection /Environment/ Pollution and nuisances /Monitoring of Atmospheric Pollution	2022_EU_COM_672_final 2021_EU_REG_1119 2021_EU_REG_0268 2021_EU_COM_550_final 2021_EU_COM_555_final 2021_EU_COM_554_final 2021_EU_COM_551_final 2018_EU_REG_0841
1.2.3 ENV_P_CHEMBIO	Environment, consumers and Health Protection /Environment/ Pollution and nuisances /Chemical, industrial risk and biotechnology	2021_EU_REG_0057 2001_EU_DIR_0018
1.3 ENV_SPACE&NATRES	Environment, consumers and Health Protection /Environment/Space, Environment and Natural Resources	2018_EU_REG_2001
1.3.1 ENV_SPACE&NATRES_WILD	Environment, consumers and Health Protection /Environment/Space, Environment and Natural Resources / Conservation of Wild Fauna and Flora	2023_EU_COM_035_final 2021_EU_REG_0057 2014_EU_REG_1143 2009_EU_DIR_0147 1992_EU_DIR_0043
1.3.2 ENV_SPACE&NATRES_WASTE	Environment, consumers and Health Protection /Environment/Space, Environment and Natural Resources / Waste Management and Clean Technology	2022_EU_COM_677_final 2020_EU_COM_098_final 2015_EU_DIR_0720 2008_EU_DIR_0098 2019_EU_DIR_0904

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2.1 CONS_INF	Environment, consumers and Health Protection / Consumers / Consumer Information, education and representation	2021_EU_REG_2117 2019_EU_REG_0034 2019_EU_DIR_2161 2014_EU_REG_0664 2012_EU_REG_1151 2008_EU_REG_1331 2004_EU_COM_0415 2006_EU_REG_0510
2.2 CONS_ECON	Environment, consumers and Health Protection / Consumers / Protection of Economic Interests	2019_EU_DIR_2161 2018_EU_REG_0848 2004_EU_COM_0415_final
2.3 CONS_HEALTH&SAFETY	Environment, consumers and Health Protection / Consumers / Protection of Health and Safety	2017_EU_REG_2393 2017_EU_REG_0625 2015_EU_REG_2283 2011_EU_REG_1131 2004_EU_REG_0641 2002_EU_REG_0178
2.4 CONS_ANIMALS	Environment, consumers and Health Protection / Consumers / Protection of Animals	2009_EU_REG_1099
3.1.1 AGR_BP_MECH	Agriculture/ Basic Provisions / Common Agriculture Policy Mechanisms	2019_EU_REG_0034 2017_EU_REG_2393
3.2 AGR_GEN	Agriculture/General	2006_EU_REG_0510 2004_EU_COM_0415_final
3.3.1 AGR_STR_SOCIAL	Agriculture / Agricultural Structures / Social and Structural Measures	2021_EU_REG_2117 2013_EU_REG_1306 2021_EU_REG_2116
3.3.2 AGR_STR_FOREST	Agriculture / Agricultural Structures / Forests and Forestry	2021_EU_COM_572_final
3.4.1 AGR_MO_MARKETS	Agriculture / Products Subject to Market Organisation / Arrangements Covering more than one market organisation	2021_EU_REG_2117 2021_EU_REG_2116 2013_EU_REG_1308
3.4.2 AGR_MO_WINE	Agriculture / Products Subject to Market Organisation / Wine	2019_EU_REG_0034 2018_EU_REG_0273 2018_EU_REG_0273
3.5.1 AGR_FUNDS_EAGF	Agriculture / Agricultural structural funds/ European Agricultural Guarantee Fund	2021_EU_REG_2115
3.5.2 AGR_FUNDS_EAFRD	Agriculture / Agricultural structural funds/ European Agricultural Fund for Rural Development	2021_EU_REG_2115 2017_EU_REG_2393 2013_EU_REG_1310 2013_EU_REG_1305

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3.6.1 AGR_L_PlantHealth	Agriculture / Approximation of laws and health measures / Plant health	2022_EU_COM_305_final 2013_EU_REG_0485 2009_EU_REG_1107 2005_EU_REG_0396
3.6.2 AGR_L_AnimalHealth	Agriculture / Approximation of laws and health measures / Animal health and zootechnics	2016_EU_REG_0429 2009_EU_REG_1099 2005_EU_REG_0001 1998_EU_DIR_0058
3.6.3. AGR_L_Feedingstuffs	Agriculture / Approximation of laws and health measures / Animal feedingstuffs	2004_EU_REG_0641
4 CFP	Fisheries/Common Fisheries Policy	2023_EU_COM_103_final
4.1 CFP_RES	Fisheries / Common Fisheries Policy / Conservation of Resources + /Other Conservation Measures	2023_EU_COM_102_final 2019_EU_REG_1241
4.2 CFP_MARKET	Fisheries / Common Fisheries Policy / Market Organisation	2013_EU_REG_1379
5.1 MARKET_FOODSTUFFS	Industrial policy and internal market / Internal market: approx of laws / Foodstuffs + /Other Provisions	2020_EU_COM_381_final 2015_EU_REG_2283 2008_EU_REG_1331 2005_EU_REG_0396 2004_EU_REG_1935 2004_EU_REG_0852 2004_EU_REG_0641 2004_EU_COM_0415_final
5.2 MARKET_OTHER	Industrial policy and internal market / Internal market: approx of laws / General Programmes Industrial policy and internal market / Internal market: approx of laws / Other sectors and approximation of law Industrial policy and internal market / Internal market: approx of laws / Fertilisers Industrial policy and internal market / Internal market: approx of laws / Dangerous substances	2019_EU_DIR_1020 2022_EU_COM_677_final 2022_EU_COM_590_final 2019_EU_REG_1009 2021_EU_REG_0057
6 ECON	Economic and Monetary Policy and free movement of capital / Economic Policy	2020_EU_COM_098_final
7.1 COMP_PRINCIPLES	Competition policy / Competition principles	2019_EU_DIR_0633
7.2 COMP_AID	Competition policy / State aids and other subsidies	2014_EU_REG_0651
8.2.3.4 EXT_CP_TP_ANTIDUMPING	External relations / Commercial policy / Trade protection / Anti-dumping measures	2016_EU_REG_1036
9.1 UNDERTAKINGS_IPR	Law relating to undertakings / Intellectual property law	2017_EU_REG_1001
10.1 IND_GEN	Industrial policy and internal market / Industrial policy: general, programmes, statistics and research / General	2021_EU_COM_350_final
11.1.1. WORKERS_SP_EMP_PROT	Freedom of movement for workers and social policy / Social policy / Employment and unemployment / Protection of workers	2021_EU_REG_0691

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To perform the actual clustering of documents into a smaller set of interpretable topics at the science-policy interface, the documents have been first analysed for set-membership relationship to the coded topic, as represented by in Fig. 9. This allowed to identify naturally occurring clusters of documents as well as analysis of document co-occurrence.

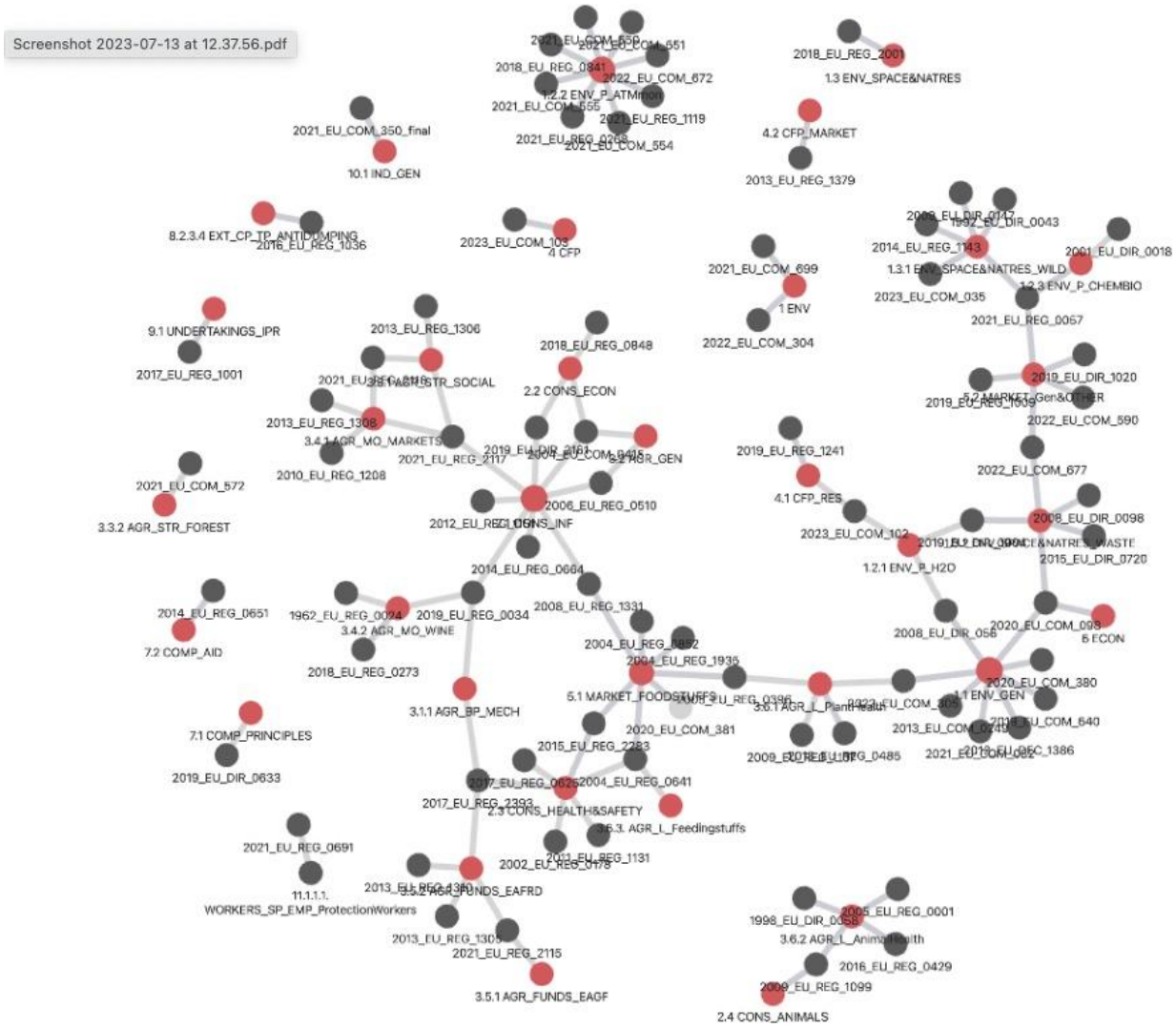

Figure 9: Final clustering of the EU policy documents into a set of 14 interpretable topics from both science and policy perspectives.

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Topic	Coded Topics	Number of docs	Docs references	Document description
Climate Change Mitigation	1.2.2 1.3	9	2022_EU_COM_672_final	Union certification framework for carbon removals (Proposal for regulation)
			2021_EU_REG_1119	European Climate Law: Establishing the framework for achieving climate neutrality by 2050
			2021_EU_REG_0268	GHG and removals from land use, land use change and forestry - forest reference levels to be applied by the Member States for the period 2021-2025 (Regulation)
			2021_EU_COM_550_final	Fit for 55 Package on Climate Neutrality (set of proposals for revision of EU Legislation)
			2021_EU_COM_555_final	Binding annual greenhouse gas emission reductions by Member States from 2021 to 2030
			2021_EU_COM_554_final	Revision of the Regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry (proposal)
			2021_EU_COM_551_final	Revision of the EU Emission Trading System (proposal)
			2018_EU_REG_0841	2030 climate and energy framework – greenhouse gas emissions, land use change and forestry (Legislation)
			2018_EU_REG_2001	Renewable energy (Legislation)
Environment	1 1.1	9	2022_EU_COM_305_final	Sustainable use of plant protection products (Proposal for regulation)
			2022_EU_COM_304_final	Nature restoration (Proposal for regulation)
			2021_EU_COM_082_final	Climate Adaptation Strategy
			2021_EU_COM_699_final	EU Soil Strategy for 2030
			2020_EU_COM_380_final	EU Biodiversity strategy for 2030
			2020_EU_COM_098_final	Circular Economy Action Plan
			2013_EU_DEC_1386	Environmental Action Programme
			2013_EU_COM_0249_final	Green Infrastructures (Natural Capital)
			2008_EU_DIR_0056	Marine Strategy Framework Directive
Waste	1.3.2	5	2022_EU_COM_677_final	Packaging and packaging waste (Proposal for Regulation)
			2020_EU_COM_098_final	Circular Economy Action Plan
			2019_EU_DIR_0904	Directive on Single-use plastics – fighting the impact on the environment
			2015_EU_DIR_0720	Reducing the consumption of lightweight plastic carrier bags
			2008_EU_DIR_0098	Waste management
Flora and Fauna	1.3.1 1.2.3	6	2023_EU_COM_035_final	EU Pollinator Initiative (Conservation measures)
			2021_EU_REG_0057	Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): lead in gunshot in or around wetlands (Regulation)
			2014_EU_REG_1143	Prevention and management of the introduction and spread of invasive alien species
			2009_EU_DIR_0147	Conservation of wild birds

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			2001_EU_DIR_0018	Deliberate release into the environment of genetically modified organisms
			1992_EU_DIR_0043	Conservation of natural habitats and of wild fauna and flora
Sustainable food systems	5.1 (part of)	2	2020_EU_COM_381_final	Farm to fork strategy for 2030
			2004_EU_COM_0415_final	European Action Plan for Organic Food and Farming
Food Safety	2.3 5.1 (part of)	10	2017_EU_REG_0625	Enforcing EU rules for the agri-food chain (Legal Act)
			2017_EU_REG_2393	Regulation amending CAP 2013 - 2020 regualtions and the regulation laying down provisions for the management of expenditure relating to the food chain, animal health and animal welfare, and relating to plant health and plant reproductive material.
			2015_EU_REG_2283	Animal Health Law
			2011_EU_REG_1131	Regulation on steviol glycosides.
			2008_EU_REG_1331	Common authorisation procedure for food additives, food enzymes and food flavourings
			2005_EU_REG_0396	Maximum residue levels of pesticides in or on food and feed of plant and animal origin (Legal Act)
			2004_EU_REG_1935	Materials and articles intended to come into contact with food
			2004_EU_REG_0852	Hygiene of foodstuffs
			2004_EU_REG_0641	Authorisation of new genetically modified food and feed, the notification of existing products and adventitious or technically unavoidable presence of genetically modified material which has benefited from a favourable risk evaluation
			2002_EU_REG_0178	Food safety law
Consumers	2.1 2.2	9	2021_EU_REG_2117	Organisation of common markets for agricultural products (One of the three main regulations implementing CAP 2023 -2027).
			2019_EU_REG_0034	Implementing regulation for CAP 2013 - 2020
			2019_EU_DIR_2161	Modernisation of Union consumer protection rules
			2018_EU_REG_0848	EU rules on producing and labelling organic products (from 2022) (Legislation)
			2014_EU_REG_0664	Establishment of the Union symbols for protected designations of origin, protected geographical indications and traditional specialities guaranteed
			2012_EU_REG_1151	Quality schemes for agricultural products and foodstuffs
			2008_EU_REG_1331	Common authorisation procedure for food additives, food enzymes and food flavourings
			2006_EU_REG_0510	Protection of geographical indications and designations of origin for agricultural products and foodstuffs
			2004_EU_COM_0415_final	European Action Plan for Organic Food and Farming
Plant and animal health	3.6.2 3.6.1	8	2022_EU_COM_305_final	Sustainable use of plant protection products (Proposal for regulation)

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			2016_EU_REG_0429	The EU animal health law
			2013_EU_REG_0485	Approval of the active substances clothianidin, thiamethoxam and imidacloprid, and prohibiting the use and sale of seeds treated with plant protection products containing those active substances (Legal Act)
			2009_EU_REG_1107	Plant Protection products on the market (Legal Act)
			2009_EU_REG_1099	Protection of animals at the time of killing
			2005_EU_REG_0396	Maximum residue levels of pesticides in or on food and feed of plant and animal origin (Legal Act)
			2005_EU_REG_0001	Protection of animals during transport and related operations (Legal act)
			1998_EU_DIR_0058	Animals kept for farming purposes
Common Agricultural Policy	3.4.1 3.3.1 3.5.2 3.4.2	11	2021_EU_REG_2117	CAP 2021 - 2027: Organisation of common markets for agricultural products (One of the three main regulations implementing CAP 2023 -2027).
			2021_EU_REG_2116	CAP 2021 - 2027: Financing, management and monitoring of the CAP (the Horisontal Regulation for CAP 2021-2027)
			2021_EU_REG_2115	CAP 2021 - 2027: Strategic Plans at MS level (One of the three main regulations implementing CAP 2021 -2027)
			2019_EU_REG_0034	Implementing regulation for CAP 2013 - 2020
			2018_EU_REG_0273	Supplementing CAP 2013 - 2020 regulations as regards the scheme of authorisations for vine plantings, the vineyard register, accompanying documents and certification, the inward and outward register, compulsory declarations, notifications and publication of notified information.
			2017_EU_REG_2393	Regulation amending CAP 2013 - 2020 regualtions and the regulation laying down provisions for the management of expenditure relating to the food chain, animal health and animal welfare, and relating to plant health and plant reproductive material.
			2013_EU_REG_1308	CAP 2013 - 2020: Common Organisation in Markets for agricultural products
			2013_EU_REG_1306	CAP 2013 - 2020: Financing, management and monitoring of the common agricultural policy and
			2013_EU_REG_1305	CAP 2013 -2020: Support for rural development by the European Agricultural Fund for Rural Development (EAFRD)
			2013_EU_REG_1310	CAP 2013 - 2020: Support for rural development by the European Agricultural Fund for Rural Development (EAFRD)
			1962_EU_REG_0024	Regulation on the progressive establishment of a common organisation of the market in wine
Forests	3.3.2	1	2021_EU_COM_572	EU Forest Strategy
Common Fisheries Policy	4 4.1 4.2	4	2023_EU_COM_103_final	The common fisheries policy today and tomorrow: a Fisheries and Oceans Pact towards sustainable, science-based, innovative and inclusive fisheries management (analysis)

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			2023_EU_COM_102_final	EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries (Common Fishery Policy - conservation measures)
			2019_EU_REG_1241	Conservation of fisheries resources and protection of marine ecosystems (Technical measures regulation)
			2013_EU_REG_1379	Common organisation of the markets in fishery and aquaculture products,
Industry	10.1	1	2021_EU_COM_350_final	New Industrial Strategy: Building a stronger Single Market for Europe's recovery
Markets and Competition	5.2 7.1 7.2 8.2.3.4 9.1	8	2022_EU_COM_677_final	Packaging and packaging waste (Proposal for Regulation)
			2022_EU_COM_590_final	Ensuring availability and affordability of fertilisers (Communication)
			2021_EU_REG_0057	Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): lead in gunshot in or around wetlands (Regulation)
			2019_EU_DIR_1020	Market surveillance and compliance of products (Legislation)
			2019_EU_REG_1009	Safe and effective fertilising products on the EU market (Regulation)
			2019_EU_DIR_0633	Agricultural and food supply chain — unfair business-to-business trading practices (Legislation)
			2017_EU_REG_1001	European Union trade mark (Legal Act)
			2016_EU_REG_1036	Anti-dumping measures (Legal Act)
Employment	11.1.1	1	2021_EU_REG_0691	European Globalisation Adjustment Fund for Displaced Workers (2021-2027) (Regulation)

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Supplementary Material

Table S1

Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	Regulation n.24 on the progressive establishment of a common organisation of the market in wine	THE COUNCIL OF THE EUROPEAN UNION	20 April 1962	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31962R0024	CC, BD	x	Economics	x	x	x	x
Regulation	Regulation (EC) No 1760/2000 of the European Parliament and of the Council of 17 July 2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products and repealing Council Regulation (EC) No 820/97	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 July 2000	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32000R1760	BD	Society	Economics	Health	x	x	x
Regulation	REGULATION (EC) No 178/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety	THE EUROPEAN PARLIAMENT AND THE COUNCIL	21 February 2002	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02002R0178-20220701	FS	Society	Economics	Health	x	Environment	Water
Regulation	Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	22 September 2003	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003R1829	FS, BD	Society	Economics	Health	x	Environment	x
Regulation	Regulation (EC) No. 1830/2003 of the European Parliament and of the Council concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC	THE EUROPEAN PARLIAMENT AND THE COUNCIL	22 September 2003	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02003R1830-20190726&rid=1	CC, BD	x	x	Health	x	Environment	x
Regulation	Commission Regulation (EC) No 641/2004 of 6 April 2004 on detailed rules for the implementation of Regulation (EC) No 1829/2003 of the European Parliament and of the Council as regards the application for the authorisation of new genetically modified food and feed, the notification of existing products and adventitious or technically unavoidable presence of genetically modified material which has benefited from a favourable risk evaluation	THE EUROPEAN PARLIAMENT AND THE COUNCIL	31 March 2004	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0641	FS, BD	Society	Economics	Health	x	Environment	Water

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Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs	THE EUROPEAN PARLIAMENT AND THE COUNCIL	29 April 2004	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32004R0852	FS	Society	Economics	Health	x	Environment	Water
Regulation	Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC	THE EUROPEAN PARLIAMENT AND THE COUNCIL	27 October 2004	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32004R1935	FS	x	x	Health	x		Water
Regulation	COUNCIL REGULATION (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and Regulation (EC) No 1255/97	THE COUNCIL OF THE EUROPEAN UNION	22 December 2004	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32005R0001		Society	Economics	Health	x	x	Water
Regulation	REGULATION (EC) NO 396/2005 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	23 Febraury 2005	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32005R0396&from=IT	FS	Society	Economics	Health	x	Environment	x
Regulation	COUNCIL REGULATION (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs	THE COUNCIL OF THE EUROPEAN UNION	26 March 2006	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:093:0012:0025:en:PDF		Society	Economics	Health	x	Environment	x
Regulation	Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	20 December 2006	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R1924	FS	Society	Economics	Health	Energy	Environment	Water
Regulation	REGULATION (EC) No 1331/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 establishing a common authorisation procedure for food additives, food enzymes and food flavourings	THE EUROPEAN PARLIAMENT AND THE COUNCIL	16 December 2008	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32008R1331	FS	Society	Economics	Health	x	Environment	x
Regulation	Regulation (EC) No 1332/2008 of the European Parliament and of the Council of 16 December 2008 on food enzymes and amending Council Directive 83/417/EEC, Council Regulation (EC) No 1493/1999, Directive 2000/13/EC, Council Directive 2001/112/EC and Regulation (EC) No 258/97 (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	16 December 2008	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008R1332	FS	Society	Economics	Health	x	Environment	x

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Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	Regulation (EC) No 1333/2008 of the European Parliament and of the Council of 16 December 2008 on food additives (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	16 December 2008	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008R1333		Society	Economics	Health	Energy	Environment	Water
Regulation	Regulation (EC) No 1334/2008 of the European Parliament and of the Council of 16 December 2008 on flavourings and certain food ingredients with flavouring properties for use in and on foods and amending Council Regulation (EEC) No 1601/91, Regulations (EC) No 2232/96 and (EC) No 110/2008 and Directive 2000/13/EC (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	16 December 2008	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008R1334	FS	Society	Economics	Health	x	Environment	x
Regulation	REGULATION (EC) No 1107/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	21 October 2009	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:309:0001:0050:en:PDF	CC, BD	x	Economics	Health	x	Environment	Water
Regulation	Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	21 October 2009	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009R1069	FS, CC, BD	x	Economics	Health	Energy	Environment	Water
Regulation	COUNCIL REGULATION (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing	THE COUNCIL OF THE EUROPEAN UNION	24 September 2009	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009R1099	FS	Society	Economics	Health	x	Environment	Water
Regulation	Commission Regulation (EU) No 1208/2010 of 16 December 2010 fixing representative prices in the poultrymeat and egg sectors and for egg albumin, and amending Regulation (EC) No 1484/95	THE EUROPEAN COMMISSION	16 December 2010	https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32010R1208	FS	x	x	x	x	x	x
Regulation	Commission Regulation (EU) No 1131/2011 of 11 November 2011 amending Annex II to Regulation (EC) No 1333/2008 of the European Parliament and of the Council with regard to steviol glycosides Text with EEA relevance	THE EUROPEAN PARLIAMENT AND THE COUNCIL	11 November 2011	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011R1131	FS	x	x	Health	Energy	x	x

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Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	REGULATION (EU) No 1169/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004 (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	25 October 2011	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:304:0018:0063:en:PDF	FS	Society	Economics	Health	Energy	Environment	Water
Regulation	REGULATION (EU) No 1151/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 November 2012 on quality schemes for agricultural products and foodstuffs	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	21 November 2012	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32012R1151	FS, BD	Society	Economics	Health	x	Environment	x
Regulation	COMMISSION IMPLEMENTING REGULATION (EU) No 485/2013 of 24 May 2013 amending Implementing Regulation (EU) No 540/2011, as regards the conditions of approval of the active substances clothianidin, thiamethoxam and imidacloprid, and prohibiting the use and sale of seeds treated with plant protection products containing those active substances	THE EUROPEAN COMMISSION	24 May 2013	https://eur-lex.europa.eu/eli/reg_impl/2013/485/oj	FS, CC	x	x	Health	x	x	x
Regulation	Commission Implementing Regulation (EU) No 612/2013 of 25 June 2013 on the operation of the register of economic operators and tax warehouses, related statistics and reporting pursuant to Council Regulation (EU) No 389/2012 on administrative cooperation in the field of excise duties	THE EUROPEAN COMMISSION	25 June 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0612	none	x	Economics	x	Energy	x	x
Regulation	REGULATION (EU) No 1288/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 establishing 'Erasmus+': the Union programme for education, training, youth and sport and repealing Decisions No 1719/2006/EC, No 1720/2006/EC and No 1298/2008/EC (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	11 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1288		Society	Economics	Health	x	x	x
Regulation	Regulation (EU) No 1293/2013 of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE	11 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1293	CC, BD	Society	Economics	Health	Energy	Environment	Water

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	and repealing Regulation (EC) No 614/2007 Text with EEA relevance	EUROPEAN UNION									

Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	REGULATION (EU) No 1304/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1304	CC	Society	Economics	Health	Energy	Environment	x
Regulation	REGULATION (EU) No 1305/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 december 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 December 2013	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0487:0548:en:PDF	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	Regulation (EU) No 1306/2013 of the European Parliament and of the Council of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Council Regulations (EEC) No 352/78, (EC) No 165/94, (EC) No 2799/98, (EC) No 814/2000, (EC) No 1290/2005 and (EC) No 485/2008	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1306&from=EN	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1308&from=EN	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	REGULATION (EU) No 1310/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013 laying down certain transitional provisions on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), amending Regulation (EU) No 1305/2013 of the European Parliament and of the Council as regards resources and their distribution in respect of the year 2014 and amending Council Regulation (EC) No 73/2009 and Regulations (EU) No 1307/2013, (EU) No 1306/2013 and (EU) No 1308/2013of the European	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02013R1310-20131220	FS, CC, BD	Society	Economics	Health	x	Environment	Water

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	Parliament and of the Council as regards their application in the year 2014										

Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	Commission Implementing Regulation (EU) No 1337/2013 of 13 December 2013 laying down rules for the application of Regulation (EU) No 1169/2011 of the European Parliament and of the Council as regards the indication of the country of origin or place of provenance for fresh, chilled and frozen meat of swine, sheep, goats and poultry	THE EUROPEAN COMMISSION	17 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1337&qid=1687875336828	FS	x	x	Health	x	x	x
Regulation	REGULATION (EU) No 1379/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the common organisation of the markets in fishery and aquaculture products, amending Council Regulations (EC) No 1184/2006 and (EC) No 1224/2009 and repealing Council Regulation (EC) No 104/2000	THE EUROPEAN PARLIAMENT AND THE COUNCIL	11 December 2013	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:354:0001:0021:EN:PDF	FS	Society	Economics	Health	x	Environment	Water
Regulation	Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	11 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1380	FS, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty Text with EEA relevance	THE EUROPEAN COMMISSION	17 June 2014	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2014.187.01.0001.01.ENG	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	COMMISSION DELEGATED REGULATION (EU) No 664/2014 of 18 December 2013 supplementing Regulation (EU) No 1151/2012 of the European Parliament and of the Council with regard to the establishment of the Union symbols for protected designations of origin, protected geographical indications and traditional specialities guaranteed and with regard to certain rules on sourcing, certain procedural rules and certain additional transitional rules	THE EUROPEAN COMMISSION	18 December 2013	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0664&from=en		x	Economics	x	x	Environment	x
Regulation	REGULATION (EU) No 1143/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2014 on	THE EUROPEAN PARLIAMENT AND THE	22 October 2014	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R1143	FS, CC, BD	Society	Economics	Health	x	Environment	Water

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	the prevention and management of the introduction and spread of invasive alien species	COUNCIL OF THE EUROPEAN UNION									

Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	Regulation (EU) 2015/2283 of the European Parliament and of the Council of 25 November 2015 on novel foods, amending Regulation (EU) No 1169/2011 of the European Parliament and of the Council and repealing Regulation (EC) No 258/97 of the European Parliament and of the Council and Commission Regulation (EC) No 1852/2001.	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	9 March 2016	https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32015R2283	FS	Society	Economics	Health	x	Environment	x
Regulation	REGULATION (EU) 2016/429 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2016 on transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law')	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	9 March 2016	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0429	FS, CC, BD	Society	Economics	Health	x	Environment	Water
Regulation	Regulation (EU) 2016/1036 of the European Parliament and of the Council of 8 June 2016 on protection against dumped imports from countries not members of the European Union (codification)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	8 June 2016	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R1036		x	Economics	x	x	x	x
Regulation	Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products, amending Regulations (EC) No 999/2001, (EC) No 396/2005, (EC) No 1069/2009, (EC) No 1107/2009, (EU) No 1151/2012, (EU) No 652/2014, (EU) 2016/429 and (EU) 2016/2031 of the European Parliament and of the Council, Council Regulations (EC) No 1/2005 and (EC) No 1099/2009 and Council Directives 98/58/EC, 1999/74/EC, 2007/43/EC, 2008/119/EC and 2008/120/EC, and repealing Regulations (EC) No 854/2004 and (EC) No 882/2004 of the European Parliament and of the Council, Council Directives 89/608/EEC, 89/662/EEC, 90/425/EEC, 91/496/EEC, 96/23/EC, 96/93/EC and 97/78/EC and Council Decision 92/438/EEC (Official Controls Regulation)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	15 March 2017	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02017R0625-20220128	FS, BD	Society	Economics	Health	x	Environment	Water

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Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	REGULATION (EU) 2017/1001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 June 2017 on the European Union trade mark (codification)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	14 June 2017	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R1001	FS	x	Economics	Health	x	x	x
Regulation	Regulation (EU) 2017/2393 of the European Parliament and of the Council of 13 December 2017 amending Regulations (EU) No 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), (EU) No 1306/2013 on the financing, management and monitoring of the common agricultural policy, (EU) No 1307/2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy, (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products and (EU) No 652/2014 laying down provisions for the management of expenditure relating to the food chain, animal health and animal welfare, and relating to plant health and plant reproductive material	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	13 December 2017	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2393&from=EN	CC, BD	Society	Economics	Health	x	Environment	Water
Regulation	COMMISSION DELEGATED REGULATION (EU) 2018/273 of 11 December 2017 supplementing Regulation (EU) No 1308/2013 of the European Parliament and of the Council as regards the scheme of authorisations for vine plantings, the vineyard register, accompanying documents and certification, the inward and outward register, compulsory declarations, notifications and publication of notified information, and supplementing Regulation (EU) No 1306/2013 of the European Parliament and of the Council as regards the relevant checks and penalties, amending Commission Regulations (EC) No 555/2008, (EC) No 606/2009 and (EC) No 607/2009 and repealing Commission Regulation (EC) No 436/2009 and Commission Delegated Regulation (EU) 2015/560	THE EUROPEAN COMMISSION	11 December 2017	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R0273	FS, CC, BD	Society	Economics	Health	x	Environment	Water
Regulation	REGULATION (EU) 2018/841 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 on the inclusion of greenhouse gas	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	30 May 2018	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841	FS, CC, BD	Society	Economics	x	Energy	Environment	x

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	emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU										

Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	REGULATION (EU) 2018/842 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	30 May 2018	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0842	CC, BD	x	Economics	x	Energy	Environment	x
Regulation	REGULATION (EU) 2018/848 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	14 June 2018	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R0848	FS, CC	Society	Economics	Health	Energy	Environment	Water
Regulation	COMMISSION IMPLEMENTING REGULATION (EU) 2019/34 of 17 October 2018 laying down rules for the application of Regulation (EU) No 1308/2013 of the European Parliament and of the Council as regards applications for protection of designations of origin, geographical indications and traditional terms in the wine sector, the objection procedure, amendments to product specifications, the register of protected names, cancellation of protection and use of symbols, and of Regulation (EU) No 1306/2013 of the European Parliament and of the Council as regards an appropriate system of checks	THE EUROPEAN COMMISSION	17 October 2018	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019R0034		x	Economics	Health	x	Environment	x
Regulation	REGULATION (EU) 2019/1009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	5 June 2019	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R1009	FS	x	Economics	Health	x	Environment	Water
Regulation	REGULATION (EU) 2019/1009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 June 2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures, amending Council Regulations (EC) No 1967/2006,	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	20 June 2019	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R1241	FS, CC	x	Economics	Health	x	Environment	Water

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	(EC) No 1224/2009 and Regulations (EU) No1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005.										

Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse (Text with EEA relevance)	THE EUROPEAN COMMISSION	15 Septembe r 2020	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0741	CC	x	Economics	x	Energy	Environment	x
Regulation	Commission Implementing Regulation (EU) 2020/1294 of 15 September 2020 on the Union renewable energy financing mechanism (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	15 Septembe r 2020	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1294	CC	x	Economics	x	Energy	Environment	x
Regulation	Commission Regulation (EU) 2021/57 of 25 January 2021 amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards lead in gunshot in or around wetlands	THE EUROPEAN COMMISSION	25 January 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0057&from=EN		Society	Economics	Health	x	Environment	Water
Regulation	COMMISSION DELEGATED REGULATION (EU) 2021/268 of 28 October 2020 amending Annex IV to Regulation (EU) 2018/841 of the European Parliament and of the Council as regards the forest reference levels to be applied by the Member States for the period 2021-2025	THE EUROPEAN COMMISSION	28 October 2020	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0268	CC	x	x	x	Energy	x	x
Regulation	REGULATION (EU) 2021/691 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 April 2021 on the European Globalisation Adjustment Fund for Displaced Workers (EGF) and repealing Regulation (EU) No 1309/2013	THE EUROPEAN PARLIAMENT AND THE COUNCIL	28 April 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0691		Society	Economics	Health	x	Environment	x
Regulation	REGULATION (EU) 2021/695 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013 (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	28 April 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2021:170:TOC	CC, BD	Society	Economics	Health	Energy	Environment	Water

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Regulations											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Regulation	Regulation (EU) 2021/1059 of the European Parliament and of the Council of 24 June 2021 on specific provisions for the European territorial cooperation goal (Interreg) supported by the European Regional Development Fund and external financing instruments	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	24 June 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1059	FS, CC	Society	Economics	x	x	Environment	Water
Regulation	Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')	THE EUROPEAN PARLIAMENT AND THE COUNCIL	30 June 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R1119	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013	THE EUROPEAN COMMISSION	2 December 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	REGULATION (EU) 2021/2116 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 2 December 2021 on the financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013	THE EUROPEAN COMMISSION	2 December 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Regulation	Regulation (EU) 2021/2117 of the European Parliament and of the Council of 2 December 2021 amending Regulations (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products, (EU) No 1151/2012 on quality schemes for agricultural products and foodstuffs, (EU) No 251/2014 on the	THE EUROPEAN COMMISSION	2 December 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0262.01.ENG	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

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	definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the Union										

Directives											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Directive	COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora	THE COUNCIL OF THE EUROPEAN COMMUNITIES	21 May 1992	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN	BD	Society	Economics	Health	x	Environment	Water
Directive	COUNCIL DIRECTIVE 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes	THE COUNCIL OF THE EUROPEAN UNION	20 July 1998	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31998L0058		x	Economics	Health	x	x	Water

Directives											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Directive	Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC - Commission Declaration	THE EUROPEAN PARLIAMENT AND THE COUNCIL	12 March 2001	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32001L0018	BD	Society	Economics	Health	Energy	Environment	Water
Directive	DIRECTIVE 2001/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	27 June 2001	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32001L0042	BD	Society	Economics	Health	Energy	Environment	Water
Directive	DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 June 2008	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0056	CC, BD	Society	Economics	Health	Energy	Environment	Water

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Directive	Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives	THE EUROPEAN PARLIAMENT AND THE COUNCIL	17 November 2008	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008L0098	FS, CC	Society	Economics	Health	Energy	Environment	Water
Directive	DIRECTIVE 2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2009 on the conservation of wild birds	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	30 November 2009	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0147	BD	x	Economics	Health	x	Environment	Water

Directives

Type of document	Title	Authority	Year	Link	Main KW	Secondary KW - Society	Secondary KW - Economics	Secondary KW - Health	Secondary KW - Energy	Secondary KW - Environment	Secondary KW - Water
Directive	DIRECTIVE 2014/52/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (Text with EEA relevance)	THE EUROPEAN PARLIAMENT AND THE COUNCIL	16 April 2014	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052	BD, CC	Society	Economics	Health	Energy	Environment	Water
Directive	DIRECTIVE (EU) 2018/2001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the promotion of the use of energy from renewable sources	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	11 December 2018	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Directive	Directive (EU) 2019/633 of the European Parliament and of the Council of 17 April 2019 on unfair trading practices in business-to-business relationships in the agricultural and food supply chain	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	17 April 2019	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019L0633&from=en	FS	Society	Economics	Health	x	Environment	x
Directive	Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment	THE EUROPEAN PARLIAMENT AND THE COUNCIL	5 June 2019	https://eur-lex.europa.eu/eli/dir/2019/904/oj	FS, BD	Society	Economics	Health	x	Environment	Water

Directives

Type of document	Title	Authority	Year	Link	Main KW	Secondary KW - Society	Secondary KW - Economics	Secondary KW - Health	Secondary KW - Energy	Secondary KW - Environment	Secondary KW - Water
Directive	Regulation (EU) 2019/1020 of the European Parliament and of the	THE EUROPEAN PARLIAMENT	20 Juner 2019	EUR-Lex - 32019R1020 - EN - EUR-Lex (europa.eu)	FS	Society	Economics	Health	Energy	Environment	Water

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	Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011	AND THE COUNCIL OF THE EUROPEAN UNION									

Decisions											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Decision	DECISION No 1386/2013/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'	European Parliament	20 November 2013	https://op.europa.eu/en/publication-detail/-/publication/b8e613ef-76de-11e3-b889-01aa75ed71a1	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

EU Strategy Document											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
EU Strategy Document	Farm to Fork Strategy	European Commission	2020	https://food.ec.europa.eu/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

Communications											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
EU Document (COM Document)	COM(2004) 415 final. European Action Plan for Organic Food and Farming	EUROPEAN COMMISSION	10 June 2004	https://czuvpraze.sharepoint.com/:x:/r/teams/fappz-t-h2020ecofos/Sdilene%20dokumenty/General/Project%20implementation/WP1/TASK%201.2/POLICY%20DOCUMENTS%20COLLECTION/FILE%20LIST_090323.xlsx?d=w99cb839412c44d1f9fee571b21f470a5&csf=1&web=1&e=8ZX1mb&nav=MTJfSDdfezM4MzYwQkFDLTQ0MjYtMjA0MS1BMjcxLTBDODg0M0Y2Q0U3RX0	CC, BD	Society	Economics	x	Energy	Environment	x
EU Document (COM Document)	COM(2013) 249 final. Green Infrastructure (GI) — Enhancing Europe's Natural Capital	EUROPEAN COMMISSION	6 May 2013	https://eur-lex.europa.eu/resource.html?uri=cellar:d41348f2-01d5-4abe-b817-4c73e6f1b2df.0014.03/DOC_1&format=PDF	CC, BD	Society	Economics	Health	Energy	Environment	Water

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EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. **A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment.**	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS	11 October 2018	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0673	CC, BD	Society	Economics	Health	Energy	Environment	Water

Communications											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
EU Document (COM Document - Strategy)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS **The European Green Deal**	EC	11-Dec-19	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640&qid=1690884927805	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. **A new Circular Economy Action Plan For a cleaner and more competitive Europe.**	EUROPEAN COMMISSION	11 March 2020	https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. **EU Biodiversity Strategy for 2030**. Bringing nature back into our lives.	EUROPEAN COMMISSION	20 May 2020	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0380; https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND	EUROPEAN COMMISSION	20 May 2020	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0381	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

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	THE COMMITTEE OF THE REGIONS. **A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system.**										
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on EU Strategy to Reduce Methane Emissions	FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS	14 October 2020	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0663	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

Communications											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change.	EUROPEAN COMMISSION	24 February 2021	https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:52021DC0082	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. A long-term Vision for the EU's Rural Areas - Towards stronger, connected, resilient and prosperous rural areas by 2040.	FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS	30 June 2021	https://eur-lex.europa.eu/resource.html?uri=cellar:6c924246-da52-11eb-895a-01aa75ed71a1.0003.02/DOC_1&format=PDF	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery	EUROPEAN COMMISSION	5 May 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0350	FS, CC	Society	Economics	Health	Energy	x	x
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. Pathway to a	FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN	12 May 2021	https://eur-lex.europa.eu/resource.html?uri=cellar:a1c34a56-b314-11eb-8aca-01aa75ed71a1.0001.02/DOC_1&format=PDF	CC, BD	Society	Economics	Health	Energy	Environment	Water

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	Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'.	ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS									
EU Document (COM Document)	Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757	EUROPEAN PARLIAMENT AND THE COUNCIL	14 July 2021	https://commission.europa.eu/system/files/2021-07/revision-eu-ets_with-annex_en_0.pdf	CC, BD	Society	Economics	Health	Energy	Environment	Water

Communications											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
EU Document (COM Document)	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2018/841 as regards the scope, simplifying the compliance rules, setting out the targets of the Member States for 2030 and committing to the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector, and (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review	EUROPEAN PARLIAMENT AND THE COUNCIL	14 July 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0554	CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement	EUROPEAN PARLIAMENT AND THE COUNCIL	14 July 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0555	CC, BD	Society	Economics	Health	Energy	Environment	x
EU Document (COM Document)	~~Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement~~	EUROPEAN PARLIAMENT AND THE COUNCIL	16 July 2021	https://eur-lex.europa.eu/resource.html?uri=cellar:0d918e07-e610-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF	CC, BD	Society	Economics	Health	Energy	Environment	x
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE	EUROPEAN COMMISSION	14 July 2021	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0550&from=EN	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

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	OF THE REGIONS 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality										
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate	EUROPEAN COMMISSION	17 November 2021	https://www.horizon-europe.gouv.fr/sites/default/files/2021-11/strat-gie-europ-enne-pour-les-sols-2030-pdf-4963.pdf	FS, CC, BD	Society	Economics	Health	x	Environment	Water

Communications											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS**New EU Forest Strategy for 2030**	EUROPEAN COMMISSION	16 July 2021	https://eur-lex.europa.eu/resource.html?uri=cellar:0d918e07-e610-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF	CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on nature restoration	EUROPEAN COMMISSION	22 June 2022	https://environment.ec.europa.eu/system/files/2022-06/Proposal%20for%20a%20Regulation%20on%20nature%20restoration.pdf	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC	EUROPEAN COMMISSION	22 November 2022	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0677	FS	x	Economics	Health	x	Environment	Water
EU Document (COM Document)	COM(2022) 305 final. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the sustainable use of plant protection products	EUROPEAN COMMISSION	22 June 2022	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0305	FS, CC, BD	Society	Economics	Health	x	Environment	Water

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	and amending Regulation (EU) 2021/2115										
EU Document (COM Document)	COM/2022/590 final. Ensuring availability and affordability of fertilisers	EUROPEAN COMMISSION	9 November 2022	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0590&qid=1668196358061	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. Revision of the EU Pollinators Initiative . A new deal for pollinators.	EUROPEAN COMMISSION	24 January 2023	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A35%3AFIN&qid=1674555285177	FS, CC, BD	Society	Economics	Health	Energy	Environment	x

Communications											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries.	EUROPEAN COMMISSION	21 February 2023	https://oceans-and-fisheries.ec.europa.eu/system/files/2023-02/COM-2023-102_en.pdf	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. The common fisheries policy today and tomorrow: a Fisheries and Oceans Pact towards sustainable, science-based, innovative and inclusive fisheries management	EUROPEAN COMMISSION	21 February 2023	https://oceans-and-fisheries.ec.europa.eu/system/files/2023-02/COM-2023-103_en.pdf	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
EU Document (COM Document)	This proposal for a Directive on Soil Monitoring and Resilience, when adopted, will put the EU on a pathway to healthy soils by 2050, by gathering data on the health of soils and making it available to farmers and other soil managers. The law also makes sustainable soil management the norm and addresses situations of unacceptable health and	DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Soil Monitoring and Resilienc	5 July 2023	https://environment.ec.europa.eu/system/files/2023-07/Proposal%20for%20a%20DIRECTIVE%20OF%20THE%20EUROPEAN%20PARLIAMENT%20AND%20OF%20THE%20COUNCIL%20on%	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

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	environment risks due to soil contamination. The proposal is accompanied by the impact assessment and guidance on EU funding opportunities for healthy soils.	e (Soil Monitoring Law)		20Soil%20Monitoring%20and%20Resilience_COM_2023_416_final.pdf							

Policy Documents/Papers/Reports											
Type of document	**Title**	**Authority**	**Year**	**Link**	**Main KW**	**Secondary KW - Society**	**Secondary KW - Economics**	**Secondary KW - Health**	**Secondary KW - Energy**	**Secondary KW - Environment**	**Secondary KW - Water**
Policy Document	Common Agricultural Policy (CAP)	EUROPEAN COMMISSION	From 1962, currently 2023-2027	https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy_en	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Policy Document	Food Security Policy	Republic of Malawi, Ministry of Agriculture and Food Security	August 2006	http://agriculture.gov.mw/Food security policy/D-Food-Security-Policy-11-09-06.pdf	FS, CC, BD	Society	Economics	Health	x	Environment	Water
Outcome of the conference - Agenda item	The Future We Want – Declaration of the UN Conference on Sustainable Development, Rio (2012)	UNITED NATIONS	June 2012	https://wedocs.unep.org/bitstream/handle/20.500.11822/13662/N1238164.pdf?sequence=1&amp%3BisAllowed=	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Policy Document	Transforming our world: the 2030 Agenda for Sustainable Development	UNITED NATIONS	25 Sepetember 2015	https://www.coe.int/en/web/programmes/un-2030-agenda	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Policy Documents/Papers/Reports	Consolidated version of the Treaty on the Functioning of the European Union. PART THREE - UNION POLICIES AND INTERNAL ACTIONS. TITLE III - AGRICULTURE AND FISHERIES. Article 39 (ex Article 33 TEC)	EUROPEAN COMMISSION	7 June 2016	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:12016E039	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water

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Outcome of the conference - Agenda item	The Future We Want – Declaration of the UN Conference on Sustainable Development, Rio (2012)	UNITED NATIONS	June 2012	https://wedocs.unep.org/bitstream/handle/20.500.11822/13662/N1238164.pdf?sequence=1&amp%3BisAllowed=	FS, CC, BD	Society	Economics	Health	Energy	Environment	Water
Convention	Convention on biological diversity	UNITED NATIONS	1992	https://www.cbd.int/doc/legal/cbd-en.pdf	BD	Society	Economics	Health	Energy	Environment	x
European Commission - Press release	European Green Deal: Commission proposes certification of carbon removals to help reach net zero emissions	European Commission	30 November 2022	https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7156	CC, BD	x	Economics	x	Energy	Environment	Water

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