Research article

# The Common Agricultural Policy 2023-2027. How member states implement the new delivery model?

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**Abstract.** All Member States submitted the final version of the CAP Strategic Plan (CSP) 2023-2027 to the European Commission by 31 December 2022. The CSPs approved by the Commission, given the relevant innovations introduced by the New Delivery Model, make specific choices in response to national needs and a programming approach typical of each country. The article aims to provide a synoptic reading of MSs' choices in the CSPs, to identify common strategic paths and national peculiarities. This analysis is realized comparing the Strategic Statements against the financial allocation in each CSP. The contribution exploits both qualitative and quantitative data and information derived from the CSPs 2023-2027. The dataset is based on the Strategic Statements of each country, and the corresponding financial allocation arising from the overviews of the CSP published by the European Commission. The article is based on a two steps analysis: a Text Mining-Clustering technique, the results of which are assessed against the analysis of the financial allocation by type of intervention conducted by the Balassa index and Concentration ratio. The Strategic Statements are sometime inconsistent with the policy mix defined in the budget allocation by type of intervention. Clusters based on Strategic Statements don't always seem to be fully in line with the actual "policy shape" defined in the budget allocation. Some interventions appear to be more discriminating than others in defining the different policy patterns. Regulatory constraints limit the margins of manoeuvre of MSs, although some of them move to voluntarily go beyond minimum commitments, highlighting specific policy choices. These choices are related to the national context in which the CAP operates, and this implies a different use of the available tools to achieve similar goals with different groups of interventions.

**Keywords:** CAP Strategic Plan, new delivery model, text mining, cluster analysis, strategic statement.
**JEL codes:** Q18, O21, D7.

## HIGHLIGHTS

·   Analysis of the CSPs' Strategic Statements allows the identification of common strategic paths and national peculiarities.

·   The Strategic Statements are sometime inconsistent with the policy mix defined in the budget allocation by type of intervention.
·   The CAP strategies at MS level are heavily influenced by the EU strategic approach and regulatory constraints.


INTRODUCTION

The new Common Agricultural Policy (CAP) requires each Member State to design a national CAP Strategic Plan (CSP) to deliver operational actions under the two CAP pillars. Each CSP must be built on an evidence-based needs assessment that undergoes rigorous prioritization to plan comprehensive and achievable interventions (Carey, 2019). For the first time, the instruments of the first pillar are integrated with those of the second pillar in one strategic Plan, along the intervention needs indicated in three general objectives subdivided into nine specific objectives and a cross-cutting objective on the knowledge and innovation system. The CSP is intended to offer MSs a relevant manoeuvrability to respond to their specific territorial needs and contexts in their own strategies, still complying with EU-level defined objectives (De Castro *et al.*, 2020). Several authors (Carey, 2019; Matthews, 2021; Cagliero *et al.*, 2021) suggest that this strategic approach is the most crucial element in the new CAP.

The aim of this contribution is twofold: to highlight the efforts made with respect to EU strategic objectives and to assess the coherence and consistency of budget allocation against MSs' Strategic Statements.

The article is organized as follows: section 1 introduces the new CAP structure, while section 2 is dedicated to a literature review, looking at the growing flexibility granted to MSs by CAP reforms. In the third section data and information collected for the analysis are described together with the definition of the methodology. Results of Text Mining-Clustering and clusters analysis against financial plans compositions and focalisation are described in the fourth section. Finally, the policy discussion and conclusions are dealt with in the fifth section.


1. THE NEW COMMON AGRICULTURAL POLICY AT A GLANCE

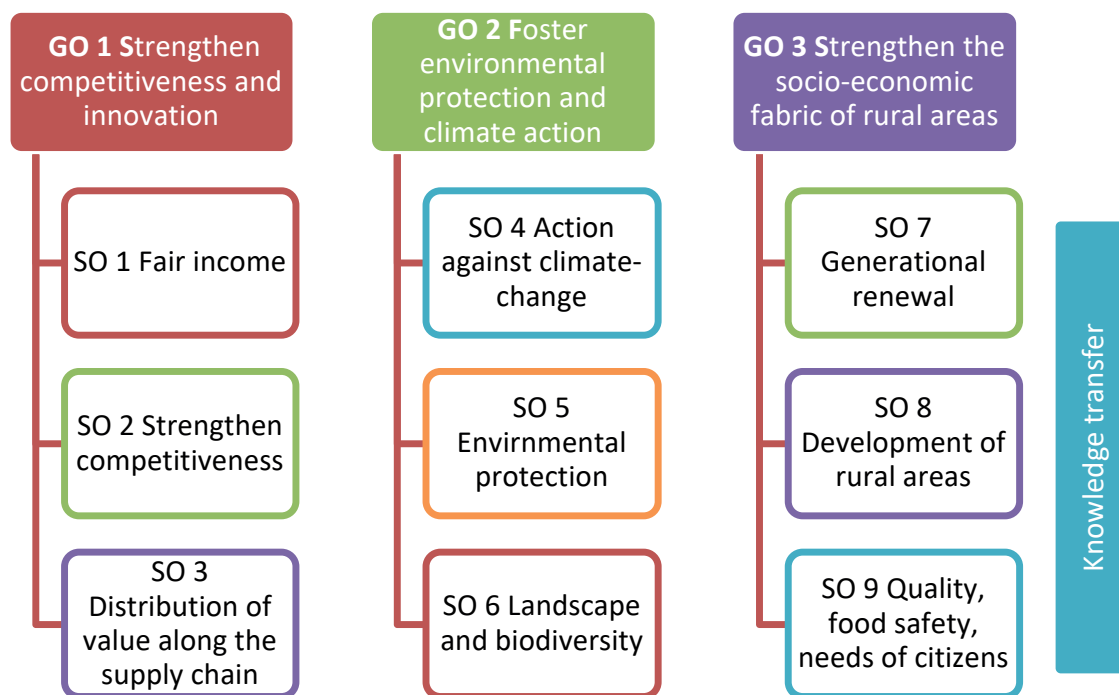After a long period of negotiations, the CAP reform 2023-2027 was formally approved by the European Parliament in the plenary session of 22-25 November 2021 and then endorsed by the Council on 2nd December. The legislative package is composite and establishes a framework for the reform of the CAP that will operate in a completely different economic and social environment from the one in which it was originally conceived. From the presentation of the proposals in 2018 until their approval, a new European Parliament and European Commission have been appointed; the COVID-19 pandemic strongly impacted the lives of European citizens and consequently influenced the political-economic choices; the UK leaving the EU impacted financial resources available for the EU budget and the CAP; the war in Ukraine has had serious consequences on political priorities, including the availability of food, production inputs and energy. The approved legislative texts confirm the structure of the proposal, inserting innovations aimed at enabling the CAP to face exogenous challenges and contribute to the New Green Deal strategy in support of the transition towards climate neutrality, considering the synergies with the Recovery and Resilience Facility introduced in the Multiannual Financial Framework 2021-2027. Although the final version of the CAP considers the needs and priorities deriving from the new challenges, many authors have observed that it would probably have been appropriate to withdraw the original proposals and present new ones more coherent with EU strategies and the emerging socio-economic framework (for more details see Pupo D'Andrea, 2021; Sotte, 2021).

The 2023-2027 CAP presents an approach that tends to modify the traditional framework for action as it proposes: a more strategic vision of intervention (the New Delivery Model); a new policy governance; an implementation model and an increasing emphasis on societal concerns that try to legitimise the CAP into EU policy framework (Erjavec and Erjavec, 2021).

The context of CAP reform has considered the new environmental, social and economic challenges of European policies, such as the European Green Deal, Farm to Fork, the Biodiversity Strategy and "A long-term vision for the EU's Rural Areas" to define interventions for the revitalisation of Europe's rural territories.

To achieve a better and more coherent strategic approach, the CAP reform 2023-2027 provides for a single programming document – the CAP Strategic Plan (CSP) – gathering all the CAP toolbox of both pillars: direct payments, sectoral interventions, rural development policies. The reform introduces a more constraining framework on MSs, including an extensive analysis to identify specific needs and prioritisations, a sound national "Intervention Logic" and the establishment of targets and milestones for both pillars of the CAP. Hence, each CSP must be built from an evidence-based

**Figure 1.** The new CAP objectives.



GO 1 Strengthen competitiveness and innovation
- SO 1 Fair income
- SO 2 Strengthen competitiveness
- SO 3 Distribution of value along the supply chain

GO 2 Foster environmental protection and climate action
- SO 4 Action against climate-change
- SO 5 Envirnmental protection
- SO 6 Landscape and biodiversity

GO 3 Strengthen the socio-economic fabric of rural areas
- SO 7 Generational renewal
- SO 8 Development of rural areas
- SO 9 Quality, food safety, needs of citizens

Knowledge transfer

needs assessment that undergoes rigorous prioritisation to plan comprehensive and achievable interventions (Cagliero *et al.*, 2022).

However, the strategic vision is constrained by the ring-fencing spending system that obliges MSs to allocate a minimum percentage of CAP financial resources to specific objectives. The most important ring-fencings concern:

- at least 25% of direct payments and 35% of the rural development policy budget must be allocated to achieve environmental and climate objectives;
- at least 5% of EAFRD resources must be allocated to the LEADER approach for the development of rural territories;
- at least 3% of the equivalent direct payments budget must be reserved for policies for young farmers and generational renewal;
- at least 10% of direct payments must be allocated to Complementary Redistributive Income Support (CRISS).

The new CAP sets out three General Objectives (GOs): to strengthen competitiveness and innovation, to foster environmental protection and climate action, and to strengthen the socio-economic fabric of rural areas. Each GO develops three Specific Objectives (SOs), plus a transversal one aimed at modernising the agricultural sector by promoting innovation and digitization, particularly through the knowledge system (Figure 1).

The CSP represents a novelty in the CAP implementation. The definition of the Plan was characterized by a high level of complexity, due to the challenge of keeping together the different policy instruments that will have to ensure the sustainable development of widely differentiated agricultural systems and rural areas. The CSPs' strategies, furthermore, must contribute to achieving the objectives of the European New Green Deal.

By 31/12/2022 all MSs had the final version of CSP approved by the European Commission. The CSPs, although constructed under a common framework and according to a common guideline, make specific choices in response to national needs and a programming approach typical of each country.

## 2. LITERATURE REVIEW

Due to the CAP reform process, the physiognomy of the agricultural policy in the EU changed over time in terms of aims, type of interventions and toolbox[1], even though characterized by a marked *path dependency*,

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[1] A wide literature exists on this topic. As a very partial list of references: Ackrill *et al.*, 2008; Jensen *et al.*, 2009; Swinnen 2008; Sorrentino *et al.*, 2011; Anania and Pupo D'Andrea, 2015; Erjavec and Lovec, 2017; Matthews, 2018; Pupo D'Andrea, 2019b.

mainly concerning the first pillar (Kay, 2003; Erjavec and Erjavec, 2021). The most recent innovation concerns the programming process, which has also been radically modified, attributing incremental margins of flexibility to MSs (De Castro, 2020; Lovec *et al*, 2020; Garcia Azcárate and Folkeson, 2020). The latter started with the CAP reform 2014-2020, especially under the first pillar. As highlighted in several studies (Swinnen, 2015; Matthews, 2015; Henke *et al.*, 2015; Ecorys, 2017; Henke *et al.*, 2018), it is in relation to direct payments that, with the 2014-2020 CAP reform, MSs have gained an unprecedented level of flexibility from the number and relevance of implementation options, while under rural development the subsidiarity principle has already been a key element in all the programming stages for decades. Under the CAP 2023-2027, flexibility and subsidiarity are combined with a rebalancing of responsibilities between the EU and MSs (Pupo D'Andrea, 2019a).

The growing flexibility granted to MSs and the tendency to provide the CAP with a more holistic approach by strengthening the link between the two pillars, led the scientific debate both to analyse MSs' decisions in each pillar aimed at tailoring the agricultural support to specific national needs and to assess the whole strategy elaborated by MSs.

An in-depth analyses of the tool boxes used by MSs under each pillar of the CAP 2014-2020 is provided by two studies commissioned by the European Parliament: Henke *et al.* (2015), focusing on the *Implementation of the first pillar of the CAP 2014-2020*, stress the high degree of heterogeneity in implementation of the new direct payments, confirming the idea that a "one size fits all" CAP is no longer suitable to the complexity of European agriculture. Dwyer *et al.* (2016), focusing on the *Programmes implementing the 2015-2020 Rural Development Policy*, show a predominance of spending on environmental measures and on physical investments for competitiveness, while less funding is devoted to broader rural development.

A whole assessment of the strategy is performed by Ecorys (2017), whose cluster analysis is the result of the choices that MSs made in the first pillar (in terms of using the flexibility provided or maintaining the *status quo*) and in the second pillar (in terms of budget allocation). The study identifies five clusters focusing on the relative importance each group attaches to each of the general CAP objectives. While Henke *et al.* (2018) run a cluster analysis on MSs choices under direct payments, focusing on *fields of flexibility* in embodying the 2014-2020 reform: i.e. the *transition* toward a uniform per-unit payment to all beneficiaries; the *selection* of beneficiaries; the *redistribution* of support among beneficiaries.

Ecorys (2017) highlights that in most MSs no integrated approach has been taken towards the design and choices under Pillar 1 and Pillar 2. While Dwyer *et al.* (2016) speak about evidence of a more strategic approach than in the previous period even though a considerable continuity exists in priorities and patterns in resource allocation. The presence of a "historic factor" is observed by Ecorys (2017), as in many cases MSs' major concern was to minimise the changes in the support provided to the agricultural sector compared to the previous CAP. While Henke *et al.* (2018) identify a *national path dependency* as a new factor shaping implementation of the CAP. Tarangioli *et al.* (2016) highlight that the menu of tools is not fully exploited, as a fragmentation of financial resources and limited integration among pillars seem to be preferred.

Despite the novelties introduced in the CAP, many scholars are critical of the effectiveness and efficiency of the 2023-2027 CAP to adequately support the European Green Deal and sustainable development (Cuadros-Casanova *et al.*, 2023; Guyomard *et al.*, 2020; Heyl *et al.*, 2020; Pe'er *et al.*, 2020; Salvan *et al.*, 2022), as well as a sustainable food system (Recanati *et al.*, 2019; Schebesta and Candel, 2020; Mowlds, 2020; Tarangioli, 2021). Criticisms also emerge regarding the effectiveness of direct payments in reducing agricultural income inequalities and achieving a fairer distribution of support while providing environmental public goods (Ciliberti *et al.*, 2022; Metta, 2020; Chatellier and Guyomard, 2023; Frascarelli, 2020). The greater flexibility granted to MSs together with the enhanced focus on performance of both pillars represent an opportunity to make the CAP more effective and efficient. At the same time, the different ambitions of MSs and the heterogeneous managing, analytical and strategic capacity of national administrations in the designing of the CSP could lead to different levels of ambition, especially from the environmental and climate point of view, with a risk of distorting competitiveness between MSs, failing to ensure a "level playing field" for all (Carey, 2019; Cagliero *et al.*, 2021; Guyomard *et al.*, 2020; Pupo D'Andrea, 2019b).

## 3. DATA AND METHODS

### 3.1. Data

At the base of the CSP there is the Strategic Statement that represents the backbone of the Plan: a national declaration drawing – in a communicative way – the main strategic lines that the CSP intends to pursue over the five-year period based on the evidence collected and tools at disposal. The formal emphasis given to the strategic lines with respect to regulatory constraints, the EU common objectives and the actual financial alloca-

**Table 1.** A proposal of interventions' aggregates under CAP 2023-27 GOs.

| Intervention | Aggregate | Indicative GO |
|---|---|---|
| Basic Income Support for Sustainability – BISS (Art. 21) | | |
| Complementary Redistributive Income Support for Sustainability CRISS (Art. 29) | Income support | GO1 |
| Natural or other area-specific constraints ANC (Art. 71) | | |
| Area-specific disadvantages resulting from certain mandatory requirements (Art. 72) | | |
| Risk management tools (Art. 76) (ex. sectoral interventions) | Risk management | GO1 |
| Investments, including investments in irrigation (Art. 73-74) | Investments | GO1 |
| Coupled Income Support CIS (Art. 32) | Coupled support | GO1 |
| Cotton (Art. 36-41) | | |
| Wine (Art. 57-60) | | |
| Apiculture (Art. 54-56) | | |
| Hop (Art. 61-62) | Sectoral interventions (+ cotton) | GO1 |
| Olive oil and table olives (Art. 63-65) | | |
| Other sectors (Art. 66-68) | | |
| Eco-scheme (Art. 31) | Environmental and climate | GO2 |
| Environmental, climate-related and other management commitments AECC (Art. 70) | | |
| Complementary Income Support for Young Farmers CIS-YF (Art. 30) | Young farmers & generational renewal | GO3 |
| Setting up of young farmers and new farmers and rural business start-up (Art. 75) | | |
| Cooperation, included LEADER (Art. 77) | COOP | GO3 |
| Knowledge exchange and dissemination of information (Art. 78) | AKIS | Horiz. |

tion defined by the country represent a combination of data and information of great interest for evaluating the recent programming phase.

The contribution exploits both qualitative and quantitative data and information derived from the CSP 2023-2027. Indeed, the dataset is based on the Strategic Statements of each country, and the corresponding financial allocation in each CSP arising from the overviews of the CSP published by European Commission, to have homogeneous data.

The European Commission describes the Strategic Statement as follows: *The overview of the CAP Strategic Plan shall outline what the CAP aims to achieve in the Member State's territory. It shall focus on the main expected results and interventions, including relevant elements of the green architecture, in light of the identified needs, and summarise key choices on financial allocation. It shall demonstrate how these aspects relate to each other. Highlights may be provided as to how the main elements provided in the Commission Recommendations for the CAP Strategic Plan have been addressed* (reg. 2021/2289, Annex I). The Strategic Statement represents the backbone of the Plan, summarizing the main strategic lines that the CSP intends to pursue over the five-year period. The contribution collects the Strategic Statements of the CSP approved by the European Commission and the financial allocation of each CSP annex to Commission implementing Decisions (EC, 2022). This

has made it possible to obtain homogeneous information in terms of quantity and quality of data. The financial allocation is related to the whole programming period aggregated by type of intervention and by CAP GOs. It is worth noting that the fruit and vegetable sectoral intervention is not considered in the financial figures as it does not have a pre-allocated envelope.

The qualitative and quantitative data on approved CSP represents a set of information of great interest for evaluating the recent programming period. It allows the coherence of the financial allocation with respect to the strategic objectives at national and European level to be assessed. It allows feedbacks on the effectiveness of the programming methodology to be provided, based on a sound "Intervention logic", developed by the European legislator to orient MSs towards solid and consistent decisions, and characterized by the presence of constraints, i.e. ring-fencing, which limit the degree of freedom at the disposal of national policy makers.

In the analysis, we used a specific aggregation of the types of interventions, considering the main goal of the tool by its nature and implementation. The proposal of these aggregates is presented in Table 1.

### 3.2. Methods

A Text Mining-Clustering (TMC) task was used as a Text Mining (TM) application to the CAP Strategic

Statements across the EU countries[2]. TM is an automatic process that combines data mining techniques, statistics and computational linguistics to uncover relationships and patterns in unstructured textual data resources (Gupta and Lehal, 2009; Younis, 2015). The TM-C is therefore a cluster analysis conducted on textual data with TM techniques, processed by choosing the software IRaMuTeQ version 0.7 alpha 2 (Ratinaud, 2014).

This textual analysis software embeds the TM-C method named ALCESTE[3] (Reinert, 2001) based on the hierarchical descending classification (HDC) algorithm known as co-occurrence text analysis (Illia *et al.*, 2014). This method individualizes statistically independent word classes found in a whole text (named textual corpus) by maximising Chi-squared distance of matrices intersecting parts of texts and words; each class is composed of words, and thus of textual segments, concatenated to each other to produce a uniform meaning because the vocabulary is similar. Consequently, each class is also dissimilar from one another because the internal vocabulary is also distinct from the one in the other classes. The mechanism starts from the whole textual corpus with descending partitioning into two big classes with the most different use of words, successively the algorithm splits those classes into other parts that are again different, although less than the first ones and so forth until partitions are no longer statistically significant (Illia *et al.*, 2014). The final classes have represented here the extent to which the strategic statements might be in common at European level. Furthermore, the main IRaMuTeQ output of the HDC process consisted of a correspondence factor analysis Cartesian graph with factors generated from the classifications and supplementary variables associated with the strategic statements' textual corpus. These factorial graphs revealed a more exhaustive visualization of how the classes were shaped, and thus how they covaried each other, together with the relative contribution of each supplementary variable[4] to each class and factor.

The results of the first step based on TM-C technique were subsequently assessed against the analysis of the financial allocation by type of intervention conducted by the Balassa index (BI) and Concentration ratio (CR).

In regional economic and trade analysis, BI is a measurement of the degree of specialisation of a territory or sector (Balassa, 1989). The index was initially used in relation to export flows (Liesner, 1958), but the procedure has been refined and is used in many fields as CAP implementation analysis or studies on competitiveness of farms, specific agri-food sectors or territories and regions, as well as in rural development evaluations (Cagliero and Henke, 2005; OECD, 2007; Nomisma, 2008; Pesce, 2008; Trione, 2009; Nuval, 2016). Balassa (1965) proposed using the ratio as an index for comparative advantage. X denotes exports, or a specific item as well as a sector or a policy, for a specific country, a specific commodity, and the world (or any reference group of countries considered), the BI is:

$$BI_{ij} = (X_{ij}/X_i)/(X_{wj}/X_w) = (X_{ij}/X_{wj})/(X_i/X_w) \qquad (1)$$

It is noteworthy that:

$$X_i = \Sigma_j X_{ij}; \; X_{wj} = \Sigma_i X_{ij}; \; X_w = \Sigma_i \Sigma_j X_{ij} \qquad (2)$$

A given country is considered to have comparative specialisation (or no specialisation) when BI is greater than 1 (minor). Thus, the comparative neutrality point is when BI is equal to unity, i.e. when the size-wise importance in the country is as big as that in the territorial macroaggregate. Here we use BI, therefore, to offer a proxy for the CSP architecture through an estimation of the budget allocation priorities on the different interventions that can be activated by the CAP: whether a particularly relevant use of one type of intervention (specialisation) can be highlighted or not in relation to the relative weight of the allocated resources and in comparison, with the average EU-wide allocations. The Balassa index has been criticized when used to provide ordinal or cardinal comparability (Sanidas and Shin, 2010). Against these limitations, in our study BI aims to identify comparative specializations in the allocation of financial resources with respect to the neutral point (EU average). Consequently, the index values should not be read to draw up a ranking (ordinal measure), nor to measure the comparative specialization or non-specialization (cardinal measure) of a given MS in the allocation of funds.

The concentration ratio (CR) in economics compares the sales of a specified number of the largest firms in the industry with the industry's total sales (Bikker and Haaf, 2002); this index is also widely used in the analysis of specific agri-food sectors (Pieri, 2013). Here we estimate a concentration ratio by calculating the relative weight of the sum of the 3 main types of intervention in relation to the overall allocation. The aim is to estimate a strategic path of concentration/polarisation of CSPs as opposed to proposing a more complex and articulated policy.

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[2] The software worked on the English versions of all the documents examined. The authors dealt with several European languages by means of specific translation software.

[3] Analyse des Lexèmes Cooccurrents dans les Enoncés Simples d'un Texte.

[4] In our study the supplementary variables are the EU countries since the analysed texts were organized by each EU country to evaluate their contribution to the cluster solution.

The methodological pathway identified thus makes it possible to analyse the consistency between the strategic declarations made in the CSPs and the actual prioritisation of interventions, through application of the specialisation and concentration indices. To this path is also added a representation of budget allocation between direct payments, market measures and rural development actions, as well as a description of the attainment of ring fencing.

## 4. RESULTS

### 4.1. CAP Strategic Commitments

The entire textual corpus of the 28 EU CAP Strategic Statements (i.e., 28 texts) was composed of 2960 words with 31172 occurrences with a mean of occurrences by text of 1113.29. The mean of words frequency (occurrences/number of words) was 13.40[5] and 1930 active[6] words with a mean of active words frequency of 16.15. The number of hapax (i.e., words that occur just once) was 886 (29.93% of words[7]); Figure 2 presents the text mining-clustering solution that reports a good percentage of classification stability (69% of the text segments correctly classified) of 5 clusters, with 2 (blue and red) more distinct than the other 3. This can be considered an optimal classification. The word clouds in the graph represent the most important words in creating each cluster and the larger they are, the more significant they are in terms of both frequency and co-occurrence, i.e. their ability to connect with others to create common topics. We reported the two-factor solution with a total inertia (i.e., total variance explained[8]) of the 62%. The factors summarize the degree of dispersion of the cluster solution (i.e., the distance from the textual content of each cluster) and they, essentially, permit to visualize how the clusters have related each other: the textual content can be dispersed one from another or concentrated to one another. The factors take also into account the contribution of the supplementary variables as well. As a matter of fact, Figure 3 plots the membership of

each MS in the 5 clusters, i.e. which country contributes most to the construction of that cluster; the bigger it is, the more it contributes. Several MSs of the same colour indicate groups with similar strategies, in relation to the topics covered in the cluster to which they belong. The significant segments useful for finding similar topics by cluster is available in the Appendix. These are the classified text segments that contributed most to the construction of the clusters[9].

**Cluster 1** (red) is characterized by words highly related to the construction of the EU CAP strategy (EU fitted), such as strategic objectives, Green deal (in particular Farm to Fork strategy) new delivery model. The Strategic Statements of MSs belonging to this cluster appear consistent with the EU major goals and strategic objectives of the CAP, at the same time, giving importance to the organizational and management elements of the new policy framework. We find both regionalised MSs, Spain, Germany, and centralised ones, such as Sweden, Denmark, Estonia, Malta, Austria. These are MSs, in the case of Spain and Germany, with a strongly market-oriented agricultural sector. In the other cases the cluster involves countries with a strongly identity-oriented agriculture and the strategies are oriented to the innovation of specific sectors or farms.

**Cluster 2** (grey) is mainly dedicated to supply chain issues to strengthen the competitiveness of the sector. We observe a focus towards the functioning of supply chains and the positioning of agricultural producers. The quality factor is also relevant. This cluster is relatable to the CAP Specific Objectives 2 (Increasing competitiveness) and 3 (Strengthening the position of farmers in value chains). Romania, Croatia, Slovenia, Cyprus and Lithuania belong to this cluster.

**Cluster 3** (green) is focused to ensure a fair level of income for agricultural producers and to strengthen the competitiveness of agricultural and agri-food businesses, to close the income gap between the agricultural sector and other sectors, as well as support for young farmers and generational renewal. It faces the challenges of competitiveness and resilience in the light of greater fairness and safety in working conditions. This cluster involves The Netherlands, Latvia, Bulgaria, Greece and Italy, a

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[5] Mean values over 5 are an indication of a good lexical richness to conduct a TM (Tuzzi, 2003).

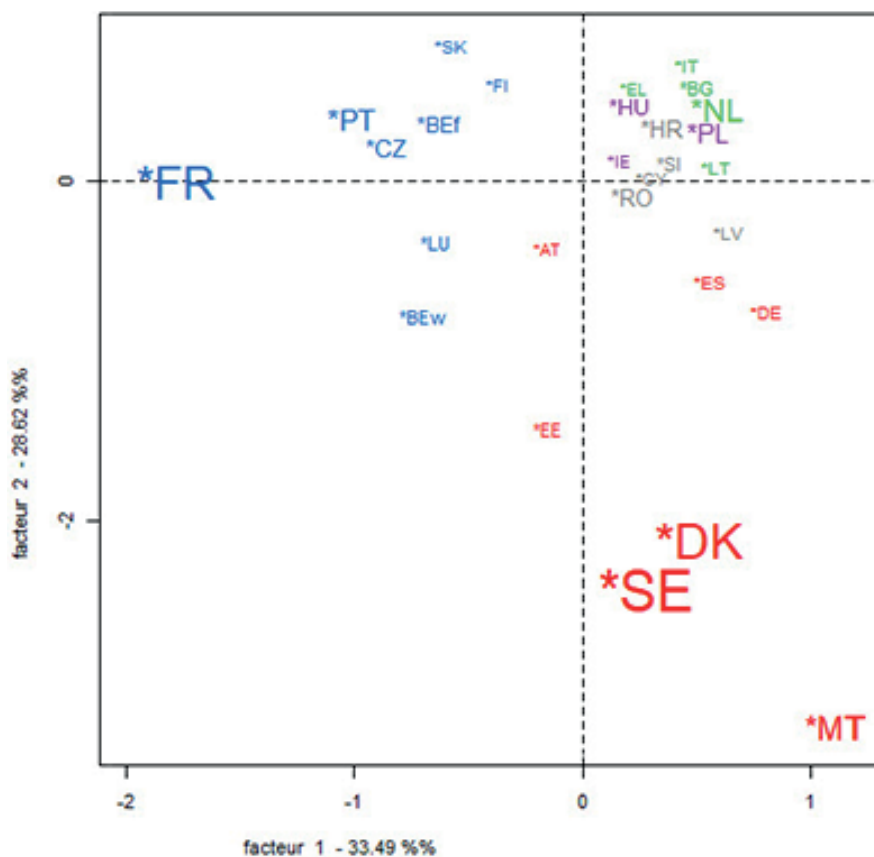[6] The active words are the words with a proper meaning cleaned by auxiliar verbs, prepositions, articles, adverbs, conjunctions and so forth that are the supplementary forms.

[7] Values under 50% are an indication of good lexical richness to conduct a TM (Tuzzi, 2003).

[8] To our knowledge there is not cut-off criteria to establish recommended levels of explained variance in ALCESTE text analysis, but it is reasonable that a researcher should have at least over 50% of the variance captured by the first two factors to make the solution visible in two dimensions.

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[9] Significant segments are classified parts of text that contribute most to the construction of the clusters. These segments are composed of the words, (and thus phrases), that most contributed (because they co-occur within each cluster). These words characterise each cluster and every word is associated to a numerical value score of the Chi-square. By summing these scores, an aggregate Chi-square value is again associated to each segment along with the reference to the MS (i.e. the strategic statement where it came from. The segments will be ordered in descending order of this aggregate Chi-square value, from the highest to the lowest; the higher this value, the more significant the segments are.

**Figure 2.** Correspondences Factorial Analysis diagram between clusters identified in the TMC.



*Source*: Authors' estimation from MS CSPs.
Note: in Red Cluster 1 (EU Fitted); in Grey Cluster 2 (Supply Chain); in Green Cluster 3 (Farm resilience); in Blue Cluster 4 (Env. and climate); in Purple Cluster 5 (Knowledge)

very heterogeneous group of MSs, characterized by a classical approach in line with the asset of CAP.

**Cluster 4** (blue) points out the goals to conserve water, soil, landscape and biodiversity, to reduce GHG and ammonia emissions and to improve animal welfare. It is focused on input sobrieties to protect natural resources and on energy efficiency and the development of renewable energy (GO2 and SO9). MSs belonging to

this cluster are France, Portugal, Czechia, the two Belgium regions, Slovakia, Finland, Luxembourg.

**Cluster 5** (purple) highlights that there is no successful development of agriculture and rural areas without efficient transfer of knowledge and innovation and networks of stakeholders. It points out the relevance of training, diversification, investments (also in digitalization) and support for infrastructure to meet the needs of

**Figure 3.** Correspondences Factorial Analysis diagram between clusters identified in the TMC and EU-countries.

Note: in Red Cluster 1 (EU Fitted); in Grey Cluster 2 (Supply Chain); in Green Cluster 3 (Farm resilience); in Blue Cluster 4 (Env. and climate); in Purple Cluster 5 (Knowledge)

rural areas, in the light of local and territorial cooperation. Poland, Hungary and Ireland are in this cluster.

In Table 2 we present a summary description of each cluster derived from the TMC procedure; we report the percentages of the segments classified within each cluster, the Member States that belong and propose a label highlighting the main feature of each cluster.

### 4.2. The composition of financial plans in the estimated clusters

The CSPs are underpinned by Euro 264 billion of EU resources, but the CAP mobilises more than Euro 307 billion of public expenditure, including national resources. Looking at the co-financing shares of rural development, a different picture emerges between MSs. Those highlighting a higher share of national co-financing are Luxembourg (80%), Belgium-Wallonia, Czechia (63% both) and Italy, which is the first co-financer

among the major recipients of the CAP (54%). Shares of less than or equal to 20% are highlighted by seven MSs, with Denmark showing the lowest share (11%).

An analysis conducted by the European Commission (2022) on all CSP shows that the CAP EU resources were distributed as follows: 72% to direct payments (DPs), 25% to rural development (RD) and 3% to sectoral interventions. More information on how EU resources are distributed between types of intervention can be found in Figure 4. The MSs allocated more than half of the budget for DPs to BISS and about ¼ of DPs is allocated to Eco-schemes. In the case of RD measures more than 70% of the budget is allocated to 3 types of interventions: AECC, Investments and Areas facing Natural Constraints.

How MSs distribute the financial resources between the different interventions depends on many factors, some exogenous, such as the initial budget allocation (of first and second pillar), and others endogenous, such as intervention's national co-financing, the choices made

**Table 2.** Cluster identified in the TMC Composition Summary Table.

| Cluster | % | Label | MS. |
|---|---|---|---|
| 1 – Red | 17.50 | EU Fitted | SE, DK, MT; EE; DE; ES ; AT |
| 2 – Grey | 16.70 | Supply Chain | RO; HR; SI; CY; LV |
| 3 – Green | 16.90 | Farm resilience | NL; LT; BG; EL; IT |
| 4 – Blue | 24.10 | Env. and climate | FR; PT; CZ; BE-F; SK; FI; LU; BE-W |
| 5 – Purple | 24.80 | Knowledge | PL; HU; IE |

*Source*: Authors' estimation from MS CSPs.

on the flexibility between pillars, the path dependence, the availability of financial resources other than CAP to finance agricultural interventions, etc.. In this analysis, both flexibility and public expenditure are considered; the first because propaedeutic to any other decisions regarding the allocation of budget between different interventions and for this reason included in the EC data utilized. The second because, although only EU funds are analysed in this work, the share of national funds on total public expenditure will serve to better characterize the choices in the clusters. Future progress of the work will have to consider the whole architecture of the CSPs to understand if and to what extent national choices confirm or distort the evidence that emerged from the EU data analysis.

Looking at the distribution of the planned expenditure under the CSP by cluster, a very differentiated pattern in the distribution of CSP resources among the different policy envelopes emerges (Figure 5). In the same figure a set of indicators consisting of CSP elements where ring-fencings applies compared with the EU level as a benchmark is considered[10]. The aim is to highlight commitments that voluntarily go beyond these regulatory constraints or above the average EU level, highlighting a peculiar policy choice.

Cluster 1, EU Fitted, devotes a share of financial resources to DPs higher than the EU average; the opposite happens in RD, where also the national co-financing level is lower. Considering the ring-fencing, a lower level of EU

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[10] The ring-fencings have been calculated on the basis of the CSP regulation. For young farmers and generational renewal Annex XII defines the reserve for young farmers: CIS-YF (Article 30) and Installation of young farmers (Article 75); Investments by young farmers (Article 73 with a weighting factor of 50%). On average, approximately 2.6% of the total budget at EU level is dedicated to this objective. At least 35% of the total EAFRD contribution has to be reserved for interventions addressing the Specific Objectives related to environment and climate, and animal welfare. Interventions falling under Articles 70, 71, 72 and 73 are eligible, however a weighting factor of 50% is applied to ANC. At EU level, we can estimate nearly 50% of resources under RD are focused on this objective. In the face of at least 5% of the total RD contribution to be reserved to LEADER, 25% of the DP to be reserved to Eco-scheme and 10% to CRISS, the EU averages are, respectively, 7.7%, 23.6% and 10.6%.

**Figure 4.** Planned distribution of DPs and RD funds in CAP 2023-2027.
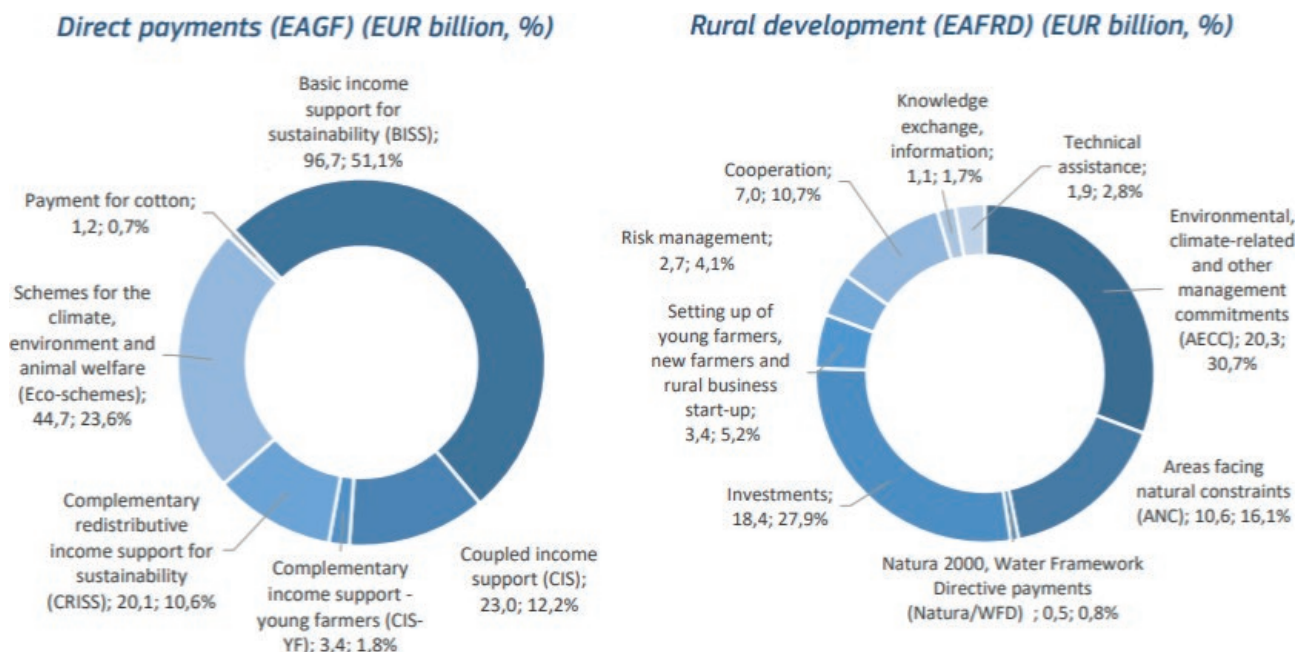


*Source*: EC, 2022.

**Figure 5.** Distance from the EU average distribution of the planned expenditure under the CAP and ring fences achievement of each cluster identified in the TMC .
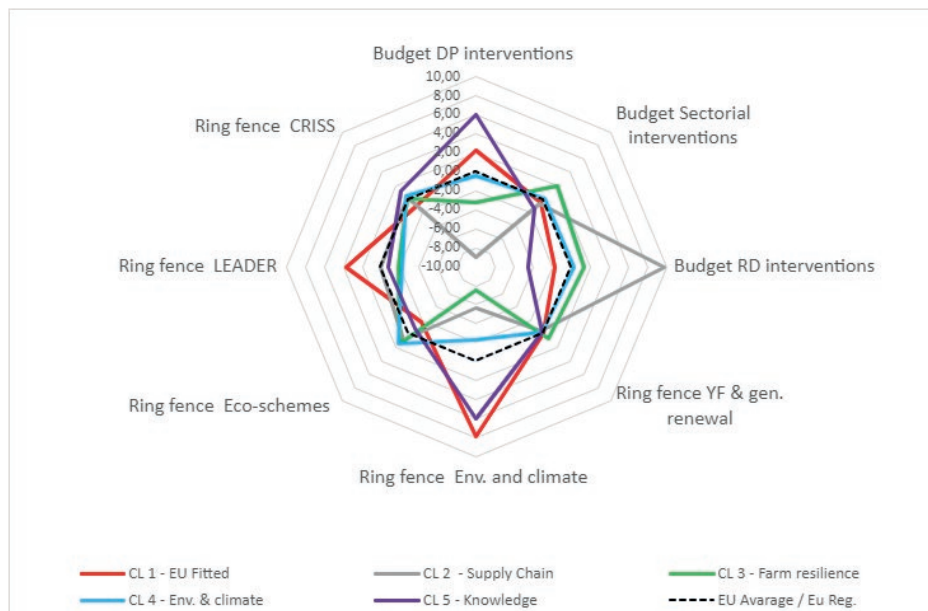


*Source*: Authors' estimation from MS CSPs.

average is shown for CRISS (determined by Malta and Denmark who don't allocate resources to the redistributive payment) and Eco-schemes, while on the RD side a greater focus than EU average is on LEADER and, above all, on environment and climate, and animal welfare.

The Supply Chain group (Cluster 2) is characterized by devoting a higher share than EU average of financial resource to RD, although with low national co-financing (about 20% of total public expenditure), and the lowest share of all clusters to DPs. MSs belonging to this group devote less RD resources to environmental, climate and welfare objectives, although meeting the minimum spending requirement, preferring the Eco-schemes of the DPs.

The group labelled Farm Resilience (Cluster 3) allocates relatively more resources to sectoral interventions, while maintaining a substantial commitment to rural development. This cluster shows a greater focus on young farmers and generational renewal, as well as on Eco-schemes.

Cluster 4, Environment and climate, presents a distribution of resources in line with the EU average. MSs belonging to this group meet the minimum spending requirements but to a lesser extent than the EU average just in the case of environmental objectives of RD, balanced by the major focus on Eco-schemes.

Finally, the Knowledge group (Cluster 5) devotes more resources to DPs than the EU average, and less to

RD. This cluster, however, presents the higher share of national co-financing (48%). A higher share than EU average is devoted to Environmental and Climate objectives and to CRISS, to better address the needs of smaller and medium-sized farms.

Definitively, the analysis shows a different positioning between old and new Member States. The first use the instruments of the CAP in an innovative way to respond to more strategic objectives. The new Member States, together with some southern European countries (Italy and Greece) and The Netherlands, emphasise the need to work on the competitiveness of the sector.

### 4.3. Heroes & Heavies: the policy specialization in the estimated clusters

Under the Balassa index (Figure 6), we can estimate the specialisation pattern in CAP policies for the different clusters. This is a proxy highlighting how the distribution of financial allocations is more (or less) focused compared to the EU average. The BI does not show which cluster has devoted the largest amount of financial resources (in absolute value) to a specific intervention; it identifies which cluster appears more specialised in respect to a specific intervention than the EU average. Within this framework, we can observe different policy shapes between the different clusters. This approach

**Fig. 6.** Balassa Index for Intervention types by cluster identified in the TMC.
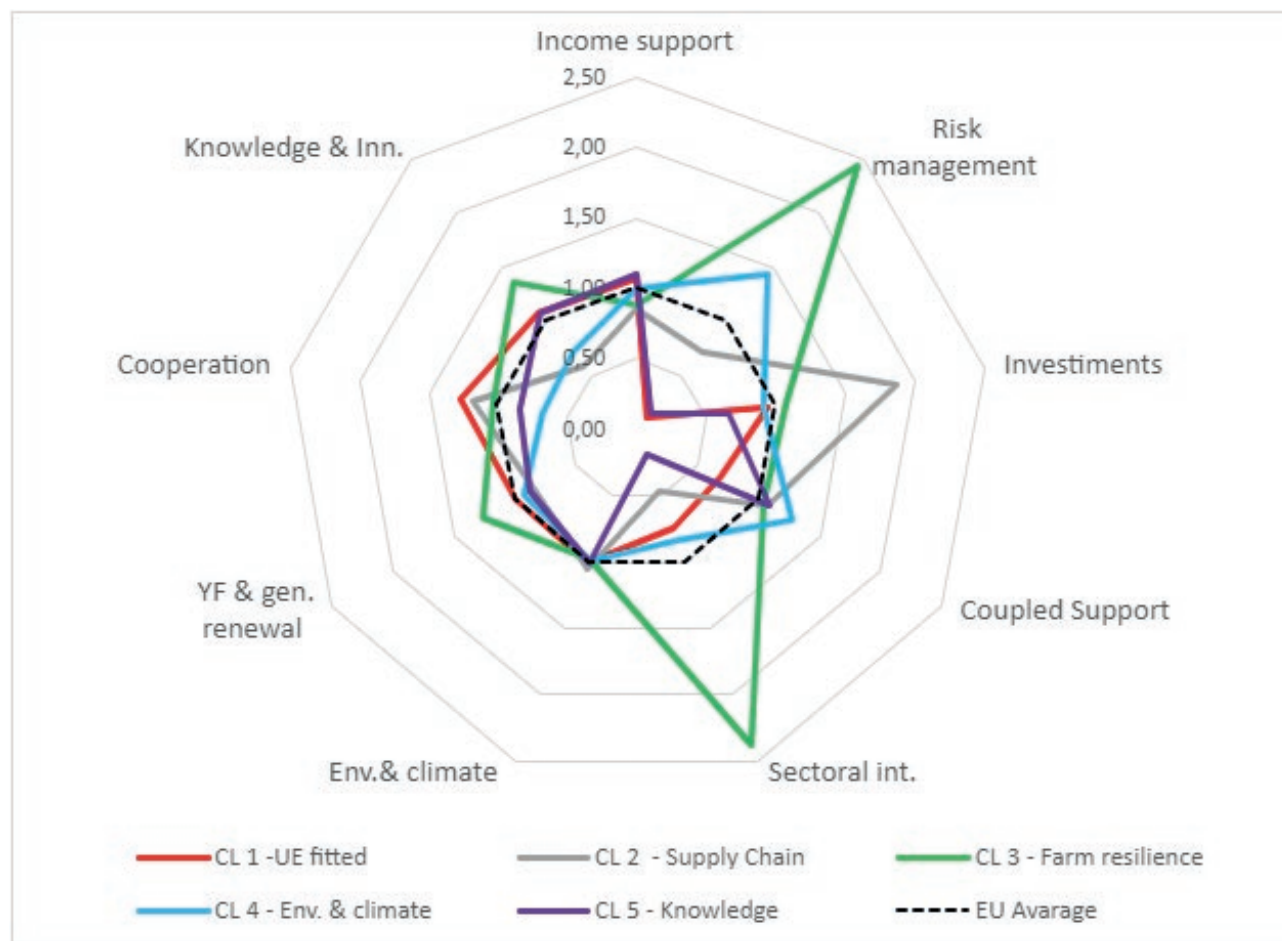


*Source*: Authors' estimation from MS CSPs.
Note: For the Intervention types see Table 1.

allows us to consider the wide differences in MSs' CAP budgets.

Cluster 1 – EU Fitted, i.e. gathering – according to the TM-C – MSs that declare a strategy aligned with that of the EU, have allocated a share of their budget higher than the EU average to Cooperation (including LEADER), followed by AKIS and Income support; other interventions, such as investments in youth and those aimed at the environment and climate are in line with the average of the 27 MSs, while the limited use of Risk management and Sectoral and Coupled interventions is peculiar. The allocation is fairly concentrated on a few interventions: the first three (Income support; AECC; Investments) account for about 85% of the total budget, in line with the EU average (Figure 4). However, it should be highlighted that this cluster is the only one to show BI values higher than (or really close to) the unit in all the types of intervention affected by EU ring-fencing:

COOP – LEADER (1.27), AKIS (1.09), Income support including CRISS (1.05), AECC (1.01) and Young farmers and generational renewal (0.99).

A different pattern emerges for Cluster 2, which reveals a strategy aimed at increasing farmers' bargaining power. These MSs have allocated a share of their financial resources primarily to Investments, Cooperation and CIS, while we estimate a low BI for Sectoral interventions, together with AKIS, Risk management, Income support and for Young farmers and generational renewal. The countries in the cluster seem to assign the development of agri-food supply chains mainly to rural development measures, these are new Member States where the development of agri-food chains, in National CAP Strategy, goes hand in hand with the modernisation and restructuring of production structures. It is worth noting that Sectoral interventions allow very narrow margins for manoeuvre, as they are pre-allocated envelopes for specif-

**Table 3.** A characterisation of clusters identified in the TMC based on the main discriminating elements (Ring-fencing, BI, CR).

| Cluster | Ring-Fencing* | Balassa Index * | Concentration Rate ** |
|---|---|---|---|
| CL1 – EU Fitted | LEADER (+) | COOP (+)<br>RISK (-); CIS (-); Sector (-) | *85%* vs. *81%* (EU);<br>INV |
| CL2 – Supply Chain | - | INV (+); CIS (+)<br>RISK (-); SECTOR (-); AKIS (-) | *81%* vs. *81%* (EU);<br>INV |
| CL3 – Farm resilience | YF (+); LEADER (-) | RISK (+); YF (+); SECTOR (+);<br>AKIS (+) | *77%* vs. *81%* (EU);<br>CIS |
| CL4 -Environment & climate | LEADER (-) | RISK (+); CIS (+)<br>COOP (-); AKIS (-) | *85%* vs. *81%* (EU);<br>CIS |
| CL5 – Knowledge | - | CIS (+)<br>RISK (-); SECTOR (-); INV (-) | *90%* vs. *81%* (EU);<br>CIS |

\* at least 20% distance from the EU average.
\*\* the third type of intervention is indicated, after BISS and ENV.

ic MSs (with the only exception of Fruit and Vegetables), although CAP 2023-2027 allowed MSs to devote up to 3% of DPs to other sectors under sectoral interventions. Such a possibility has had limited adoption in general and none of the MSs belonging to this cluster adopted it.

MSs declaring a strategic vision based on farm resilience (Cluster 3) show a less polarised policy shape than the others, with an approach based on a greater distribution over different types of intervention. The estimated concentration ratio is the lowest, not reaching 77%. The three most relevant measures in value are Income Support, AECC and CIS. This cluster is characterised by a high BI value for Risk Management, Sectoral Interventions, AKIS and Youth. Also specialised, but more in line with the EU average are Investments, Cooperation and Coupled support.

The focus on environmental and climate issues characterises Cluster 4 in the TM-C analysis. MSs belonging to this cluster show a high specialisation for Risk management and CIS and a lower one for Income support. Relatively low specialisations, but not far from the average of the 27 MSs, are observed for Investments, AECC, and generational renewal and support for Young farmers. Regarding the other interventions, the BI-value is below the EU average (<0.85). The concentration in the first three interventions is 85%, but it should be mentioned that more than 53% of the resources are reserved for direct payments and ANC.

The last cluster identifies a strategy related to knowledge and innovation (Cluster 5). The estimated BI value for interventions focused on AKIS themes is above unity and is in line with those estimated for Income support payments and CIS. The share devoted to AECC is in line with the EU average. In contrast, the other interventions are considered low specialisation, in particular Risk management and Sectoral interventions. The concentration on the first three interventions is the highest (almost 90%) and is mainly attributable to direct payments, both coupled and decoupled.

## 5. DISCUSSION

According to the expectations of the European Commission, the Strategic Statement presents an overview of the CSP outlining what the CAP will do in the MS territory. It focuses on the main expected achievements and interventions (including the relevant elements of green architecture) considering the identified needs and summarises key choices on financial allocation. Hence, as mentioned, the Strategic Statement represents the backbone of the Plan, summarizing the main strategic lines that the CSP intends to pursue over the five-year period.

Thus, coherence among Strategic Statements and budget allocation ought to be robust. This is expected to be particularly meaningful especially due to the sound methodology built around the principle of "Intervention logic" at the base of each CSP, while a levelling effect might be played by the ring-fencings, which strongly limit the degree of freedom at the disposal of the MSs. However, the cluster analysis based on MSs' Strategic Statements doesn't seem always fully in line with the actual "policy shape". Such a mismatch is more evident in some clusters (i.e. Cluster 4) than in others (i.e. Cluster 2).

At the same time, it emerges that neither the institutional organization of the MS (centralised vs. regionalised) nor the geographical location (north vs. south, east vs. west) seems to discriminate in the choices of the MS.

As in the case when applying optimisation software with the same parameters for all, the solutions cannot

diverge too much. A first piece of information that we can derive is which issues are, or are not, discriminating in the choices made by the MSs and aggregated in the 5 clusters. Not all the information gathered is consistent in determining different patterns and specific shapes of policy (Table 3). As already mentioned, regulatory constraints necessarily lead to a substantially similar application of different policy instruments.

If we look at the analyses done on ring-fencings, we observe that relevant differences result only for the incidence of LEADER on rural development, even if all clusters show a share of budget allocated to LEADER higher than the minimum expenditure required; partially also the indications concerning young farmers and generational renewal show different applications. While the environmental ring-fencings under both RD and the Eco-schemes of DPs, due to their ambitious nature and magnitude lead to very similar applications, as do the choices made concerning redistributive payments.

The analysis conducted via Balassa indices provides a more detailed picture. We can highlight some interventions that concretely have a discriminating function between the different clusters. Risk management, Sectoral interventions, AKIS are the factors that most discriminate one cluster from another; as also, to a lesser extent, can Investment and Cooperation (LEADER and EIP). What might seem paradoxical is that interventions with the highest amount of financial resources, i.e. Income support and AECC under RD, actually describe very similar applications in different clusters, accordingly with the EU average values. This is only an apparent paradox, because this picture confirms that the particularly strict and specific rules determining the application of these interventions (ring-fencings), together with a certain path dependence bias, necessarily lead to very similar choices among MSs and clusters. However, we must consider that BI does not estimate either the absolute value or the simple relative weight of each intervention on the total per cluster, but the relative incidence of the intervention in comparison to the same ratio at EU level. In this light, an intervention that is perhaps not preponderant on the national overall financial framework, becomes instead very indicative if we analyse the level of relative prioritisation, because it indicates a precise policy choice with respect to the EU framework.

The inability to discriminate in policy patterns between MSs of Environmental and Climate interventions in the RD and Income support payments is confirmed in the analysis based on the CR3 estimate. These two types are the most allocated interventions in all clusters, while only the third intervention (Investments

or Coupled payments) by allocation seems to lead to differences in policy choices.

A final aspect is the possibility of defining policy shapes for the different clusters. We can indicate some peculiar characteristics for each cluster from the aggregation of the deviations indicated by the estimation of the different BIs and the declination of the deviation from the EU average of the CR3. In Figure 7, we use a graphical representation of this intersection of the two pieces of information.

The cluster that stands out the most from the others is the one we have labelled "Farm Resilience". The use of different tools characterises the policy shape of this cluster as well as the choice of interventions that only partially act directly on farm incomes, but which contribute to creating conditions for the growth of the sector and with sectoral choices: Risk Management, Sectoral interventions and those still coupled, AKIS and the focus on young people and generational renewal.

The second Cluster by distance from the EU average is based on a strategy focused on the bargaining power of farmers. MSs focus their resources especially on Investments, which are also the third intervention by financial allocation, and on Coupled support, whilst the level of specialisation is particularly low for Risk management and AKIS and Sectoral interventions. This picture, however, does not appear entirely consistent with the stated strategy; we would have expected a stronger focus on Sectoral support (also considering the possibility, not exploited, to apply the sectoral intervention to other sectors) and AKIS and more generally on network policies, as well as on strengthening farm structures.

The Knowledge Cluster indicates strong performance in fulfilling environmental ring-fencing and a consistent specialisation towards Coupled support. In contrast, we observe low specialisation in the case of Risk management, Investments and Sectoral interventions. This cluster is characterised by the highest con-

**Figure 7.** Cluster identified in the TMC summary by the main analyses conducted.
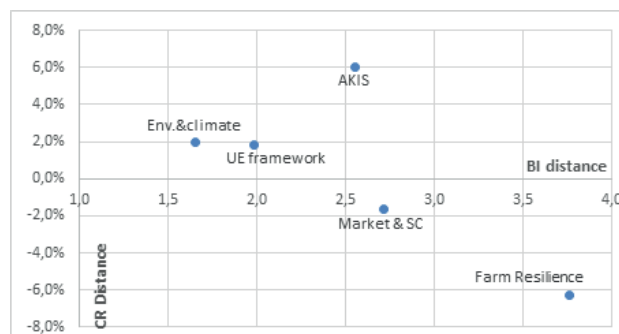
centration (90%) of the first three policies, where again a significant role is given to Coupled support.

Clusters 1 and 4 converge on the EU vision of a greener CAP and show a specialised focus on climate-environmental interventions. However, the patterns of the two clusters diverge on the other GO of a smart, competitive, resilient and diversified agricultural sector and to strengthen the socio-economic fabric of rural areas (Art. 6 of the CSP regulation). Cluster 1, which shows a marked coherence towards the Union's strategy, can be considered oriented towards the themes of general objective 3, i.e. the development of rural areas. In fact, in the policy shape of this cluster, we observe a specialisation for LEADER and Cooperation processes more generally, against a low BI-index for interventions linked to productive sectors and Risk management. On the contrary, Cluster 4, with a more environmental and climatic character, is little oriented towards these themes and towards interventions such as AKIS and Cooperation, while Risk management and CIS show a high BI level.

## 6. CONCLUSIONS

The analysis of the financial allocation by type of intervention, and their coherence and consistency with MSs' Strategic Statements, evidently represents a *proxy* for the strategic approach developed by each MS, considering that the achievement of results and strategic objectives can be realized by means of different interventions and a multitude of combinations of interventions under the CAP toolbox. This analysis has been conducted taking into account the EU financial resources, not considering the national co-financing for interventions under the Second pillar, which, in some cases, could reverse some of the conclusions regarding specific priorities. However, information about the share of EAFRD on public expenditure has been considered showing that the EU average is around 60%, with some of them who have chosen a higher national co-financing (just under 50%) and others (Cluster 2) significantly lower (20%). The second element to be considered is the possibility of achieving the strategic objectives through financial resources other than those made available by the CAP (for example the Recovery and Resilience Facility). Despite these limitations, the analysis provides interesting evidence, useful for an *ex ante* evaluation of the programming phase at EU level.

This work aims to be a first contribution to stimulate the debate around the strategic choices of MSs and the coherence of interventions adopted. Future progress will consider the contents of the MSs' CSPs and their target indicators, as soon as they are all available, and the structural and socio-economic characteristics of the MSs.

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APPENDIX

**Table A.1.** Distribution of the planned expenditure under the CAP by cluster identified in the TMC (%).

|  |  | CL 1 -UE fitted | CL 2 – Supply Chain | CL 3 – Farm resilience | CL 4 – Env. and climate | CL 5 – Knowledge | EU Avarage |
|---|---|---|---|---|---|---|---|
| % budget | DP | 75,0% | 63,8% | 69,5% | 72,4% | 78,8% | 72,8% |
|  | Sector | 1,3% | 1,1% | 3,8% | 1,9% | 0,4% | 1,8% |
|  | RD | 23,6% | 35,1% | 26,7% | 25,7% | 20,8% | 25,4% |
|  | RD EAFRD/Pub.expend. | 61,8% | 79,6% | 53,8% | 60,7% | 52,3% | 59,9% |
| Ring fences | YF & gen. renewal | 2,6% | 2,2% | 3,3% | 2,4% | 2,3% | 2,6% |
|  | Env. & climate | 55,6% | 42,2% | 40,3% | 45,5% | 53,8% | 47,8% |
|  | Eco-schemes | 21,8% | 24,5% | 25,0% | 25,1% | 22,8% | 23,6% |
|  | LEADER | 11,4% | 7,7% | 5,9% | 5,5% | 7,0% | 7,7% |
|  | CRISS | 9,5% | 10,9% | 10,8% | 11,1% | 11,8% | 10,6% |

*Source*: Authors' estimation from MS CSPs.

**Table A.2.** Balassa Index and Concentration Ratio by cluster identified in the TMC.

|  |  | CL 1 -UE fitted | CL 2 – Supply Chain | CL 3 – Farm resilience | CL 4 – Env. and climate | CL 5 – Knowledge | EU Avarage |
|---|---|---|---|---|---|---|---|
| Balassa Index | Income support | 1,08 | 0,85 | 0,88 | 1,00 | 1,10 | - |
|  | Risk management | 0,12 | 0,73 | 2,45 | 1,43 | 0,16 | - |
|  | Investiments | 0,94 | 1,87 | 1,08 | 0,92 | 0,65 | - |
|  | Coupled Support | 0,68 | 1,07 | 1,04 | 1,27 | 1,08 | - |
|  | Sectoral int. | 0,74 | 0,46 | 2,38 | 0,84 | 0,18 | - |
|  | Env. and climate | 1,01 | 1,05 | 0,97 | 0,99 | 1,01 | - |
|  | YF and gen. renewal | 0,99 | 0,85 | 1,27 | 0,92 | 0,87 | - |
|  | Cooperation | 1,27 | 1,19 | 1,04 | 0,68 | 0,84 | - |
|  | Knowledge and Inn. | 1,09 | 0,59 | 1,36 | 0,71 | 1,07 | - |
| Concentration Ratio 3 |  | 0,85 | 0,81 | 0,77 | 0,85 | 0,89 | 0,83 |

*Source*: Authors' estimation from MS CSPs.