Beyond Data Sharing: The Position of Patients and Farmers in the Common European Data Spaces

Paola Cardozo-Solano[1]

[1] Vrije Universiteit Amsterdam, The Netherlands
p.b.cardozosolano@vu.nl

Abstract. The Common EU Data Spaces (CEDS) are an EU Commission initiative aimed at creating data-sharing ecosystems across strategic sectors. This article examines how decision-making, participation, and rights are distributed within these ecosystems, focusing on grassroots actors through the analysis of the European Health Data Space (EHDS) and the Common EU Agricultural Data Space (CEADS), given their historical interconnection, ongoing digital transformations, and existing stakeholder imbalances. Then, the central research question guiding this article is: How are grassroot actors, particularly farmers and patients, positioned within the legal and policy frameworks of the CEDS, and what roles and rights are they granted within the EHDS and the CEADS?
Drawing on critical scholarship and an analysis of the legal and policy framework behind CEDS, it is observed that innovation within CEDS has not been devised in a neutral manner. Farmers and patients are largely cast as 'data generators', essential to the operation of the data exchange project; yet, particularly for-profit actors are assigned roles that better position them to capture the value generated by this initiative. At the individual level, both farmers and patients, are granted narrow, largely formal rights, insufficient to counter power asymmetries from the datafication process. Their collective capacity to defend their interests remains constrained in both data spaces, with participation largely limited to representation, rather than influence over generation of economic value from data.

Keywords: Common European Data Spaces, EHDS, CEADS, datafication, innovation policies.

Introduction

A useful way of approaching EU policies is to ask: "How is Europe being imagined here?"[1]. This question can be raised to the Common European Data Spaces (CEDS) initiative. The CEDS constitute a flagship initiative of the European Commission, as outlined in the European Strategy for Data and the Data Union Strategy, representing a recent expression of the revival of EU industrial policy. The EU Commission aims for CEDS to create environments in which data can be shared securely and used collaboratively among stakeholders in strategic sectors (e.g., manufacturing, health, energy, agriculture, and defense), with the goal of fostering data-based innovation and facilitating access to data for AI development [2].

The central research question guiding this article is: How are grassroot actors, particularly farmers and patients, positioned within the legal and policy frameworks of

the EU Common Data Spaces, and what roles and rights do they receive in the European Health Data Space (EHDS) and the Common European Agricultural Data Space (CEADS)? This question will be answered by conducting a comparative legal and policy analysis of the EHDS and CEADS through the lens of critical studies on datafication and innovation policies.

The choice of the health and agricultural sectors is not incidental. These historically interconnected domains provide a particularly strong basis for comparison: both involve growing process of digitalization, generation and processing of sensitive and valuable sectoral data, rely on complex ecosystems of public and private actors, and raise concerns about the position of individuals and societal groups.

As for the health sector, the COVID-19 pandemic exposed the critical need for the sharing of electronic health data across Member States, establishing it as an essential asset for research, policymaking, health threat preparedness and response, and patient safety, then, serving, in part, as a catalyst for the EHDS initiative. Here, health data is recognized by the EU not only as an essential resource for healthcare and health research, but also as a strategic asset for "the competitiveness of EU industry" [3]. This raises the question of whether the initiative enables individuals to exercise meaningful control and decision-making, both individually and collectively as stakeholders, over the transformation of their health and bodies into data intended to generate value for public authorities, medical research, and commercial purposes.

A parallel dynamic can be observed in the agricultural sector. The Common European Agriculture Data Space aims to foster data exchange in the agri-food sector through a federated model in order to enhance innovation and competitiveness [5, 6]. However, an important question is whether the allocation of roles places farmers in a position comparable to that of other stakeholders to control their data but also innovate and generate value. Results then necessary to assess whether the frameworks that enable data exchange are adequately suited to the specific characteristics of the agri-food sector and to farmers' needs.

Taken together, these developments reveal a common structural pattern across both sectors and data spaces. Farmers and patients are essential to the functioning of data spaces as primary data generators; however, their capacity to influence what is susceptible to be turned into data, and how that data is used remains limited. Direct benefits and decision-making power appear less clearly defined than for other participating stakeholders, while control and consent over data use are eroded. This, in turn, risks reinforcing existing power asymmetries and deepening dependencies on private sector actors, particularly within the technology domain.

Following the research gap identified by critical scholarship, this article explores the parallel dynamics through which the 'infrastructures of datafication' introduced as innovation operate across different contexts and sectors [7][8]. Overall, data spaces are not only technical infrastructure, but encompass fundamental discussions on access and value distribution across data ecosystems and sectors as a whole, as well as also on the actors who get to shape these processes and are best positioned to leverage them [9].

The contribution of this article is threefold. It offers a systematization of knowledge concerning this new EU industrial policy, contributing to the emerging body of scholarship on Common European Data Spaces. It further values the position of societal groups, such as patients and farmers, within datafication policies in the EU. Finally, the approach adopted here provides insight into how the EU Data Strategy unfolds at the sectoral level, highlighting key commonalities, differences, and implications of digital innovation and datafication policies in the EU.

Methodology

This article adopts a legal and policy review to examine the rights and roles of farmers and patients within the CEDS, specifically the CEADS and EHDS, through the theoretical framework of critical studies of datafication and innovation policies.

For the theoretical lens adopted here, the analysis considered academic literature from the areas of Critical Data Studies, STS, Critical Agrarian Studies, and Critical Health Studies. This review identified central insights for the analysis of CEDS, including the critique of the presumed neutrality of innovation policies, the elements that constitute the process of datafication, the growing influence of corporate interests in the development of these policies, and the broader societal drawbacks of this understanding of innovation.

The second section of the article examines the documents that constitute of the EU Data Strategy, focusing on the rights that they are granted to farmers and patients as individuals and the roles assigned to them as stakeholders. The policy documents issued in 2020 and 2025 by the European Commission to shape the EU Data Strategy were also considered. Regarding the EHDS, the analysis reviewed the EHDS Regulation (EHDSR) and, to a lesser extent, the GDPR, alongside legal academic literature on data protection and the EHDS. For the CEADS, it covers Chapter II of the Data Act, the policy brief produced by the AgriDataSpace project, and publicly available information from the CEADS website, along with legal literature on data-sharing in the agri-food sector and scholarship addressing the CEADS from data protection and competition law perspectives. Finally, the research acknowledges a limitation: since the CEADS is still under development, its analysis is necessarily based on whatever information has been made public so far.

1. Innovation and Datafication policies: Challenging their neutrality

This section outlines the theoretical framework guiding the analysis followed in Section 2 regarding CEDS, by drawing on the existing scholarship from STS and critical data studies on innovation policies and datafication. The literature here reviewed points to the entanglement between these policies and data; while datafication itself is often justified and shaped through the language of innovation. This section first examines

innovation beyond its presumed neutrality, then explores how market logics shape innovation, datafication, and their broader implications.

1.1. Innovation and datafication policies: Beyond the stated goals

Digitalization refers to the socio-technical process of integrating digital technologies into existing practices with the aim of using the data gathered to interpret the past, make predictions, and improve the accuracy of decision-making [10]. Policies concerning the implementation of digital technologies and the deployment of data-intensive technologies are, with increasing frequency, accompanied by the term 'innovation'. In its classicals sense, innovation can be understood as the creation or improvement of a product, service, or process in a given context, which results in improvements in terms of efficiency or quality [11]. However, its extensive and frequent use in policy-making can also be explained by the 'subjectively positive connotation' the term carries, which lends these policies an aura of technical expertise and objectivity [12].

This section puts forward the idea of reconsidering the meanings attached to innovation policies, and in particular offers an analytical framework to challenge their presumed neutrality. Innovation policies, it is argued, share the same underlying patterns as policy-making more broadly: they involve decisions about what counts as a problem, how budgets should be allocated, whose interests prevail, and, ultimately, what kinds of futures are considered desirable [12].

This means that what we currently understand as 'innovation' is closely entangled with a corporate vision of digitalization and data-intensive practices. It is worth taking a step back to reconstruct what innovation can entail, and who can be considered an innovator. As IPES-Food argues, innovation can be generated not only top-down but also bottom-up, emerging from grassroots actors within a given sector; it can be led by corporations as much as by public actors, societal groups, or individuals; it can pursue productivity and efficiency as goals, but also environmental protection or participation; and it can originate in private R&D investment or, just as often, in necessity and resourcefulness, with the agri-food sector offering a good example of the latter [12].

In sum, by arguing that innovation policies are not neutral but inherently political [12], it becomes possible to uncover the policy choices embedded in technological change, and in particular, in policies that promote specific paths of technological development and their economic consequences. What we understand by innovation — the actors it serves, the broader goals it obeys, and the means through which it is realized—, is socially and politically constructed. This is a crucial realization for evaluating not only innovation initiatives such as the Common EU Data Spaces, but also policies with a strong component of digitalization or data-processing activities.

When discussing data-driven policies, it is essential to also address datafication. Datafication involves the transformation of human and non-human worlds into data, a process that enables value generation and that can, in some cases, lead further into commodification or assetization [13][8][14]. Through their comparative analysis, Kuch et al. show that both the health and agriculture sectors have been significantly affected

by datafication, which translates activities and objects as diverse as "brain activity, genes, and soil chemicals" into data [7]. Importantly, Couldry and Mejias emphasize that data does not exist in nature and cannot be separated from either the external infrastructure that processes it or the processes of value generation it enables [13]. Building on this, this article argues that datafication is likewise the outcome of a social and political process driven by economic and financial considerations. As Kuch puts it, datafication is no longer merely the outcome of policy-making; it has become itself "a rationale for policy-making" [7].

The concept of datafication is critical precisely because it allows the analysis to begin not where it conventionally does, i.e., data collection, but with the prior social process of abstraction through which certain objects, beings or interactions come to be recognized as susceptible to, and worthy of, conversion into data.

Therefore, for digital innovation policies, the analysis should begin earlier than the question of how data is collected and processed, which is the traditional starting point. It must instead begin with the question of what goals we want innovation and policy-making to serve in the first place [15]. This question is crucial, since the very definition of those goals is not neutral with respect to the knowledge that later emerges from the use of technology and data processing: what we consider worth noting, and worth gathering data on, the knowledge that derives from it, and the courses of action it makes possible, are all shaped by which data has been chosen for collection and processing. In other words, scrutiny of data processing comes too late: the critical decisions have already been made earlier, when the ultimate purposes and interests that technologies and data are meant to serve were decided [15].

1.2. On corporate-driven innovation policies and datafication

At present, digital innovations are, on the one hand, increasingly leveraged by policy-makers, supranational actors, and international institutions as a fundamental and seemingly inevitable stage for achieving economic and social goals; digitalization is thus gaining massive relevance not only in the public discourse of these institutions but in the budgets of entire sectors. On the other hand, corporate and profit-driven perspectives are gaining traction in shaping how these digital innovation policies are designed and developed. The problems arising from corporate-led innovation policy are discussed in detail below.

First, critical scholarship points out that national or institutions promote claims similar to those built by industry actors on market or productivist logics [16]. In other words, typically major players are able to influence decisions about what is deemed relevant to convert into data and the generation of value from that data [16]. In this respect, narratives play a crucial role in shaping how data are understood, valued, and governed, and securing public persuasion[16]. Innovation is thus presented, again, as an unquestionable policy objective, frequently paired with vaguely defined public goals, for which a 'data-driven' future still offers unclear promises [17].

Second, these policies reinforce dominant actors while enabling Big Tech to shape the development and scaling of datafication [16]. This constitutes a form of 'sphere transgression' where tech companies leverage advantages gained in their own domain and translate them into illegitimate power in others [21]. The concern is heightened by the risk that this phenomenon results in the concentration of power and decision-making within a small number of oligopolistic firms, whose interests may not align with those of other, less powerful, stakeholders [22].

What matters most, however, is not simply that policymakers are promoting certain technologies in ways that favor particular actors, but that in doing so they are reshaping entire value chains, industries, sectors, and everyday life itself. Innovation, accordingly, should not be evaluated solely in terms of technological adoption or efficiency, but also in terms of its broader social, political, and ecological consequences.

Third, Birch and Chiapetta [14] connecting with this section's central claim that innovation is not neutral, describe a form of technoscientific capitalism, in which the innovation–finance nexus reveals that the mainstream understanding of 'innovation' is driven by the logics of rentiership capitalism. Taking this further, the crucial policy question becomes how to understand the implications of turning personal and non-personal data into a 'political-economic' resource capable of being privatized, enabling the extraction and capture of value in subtle yet complex ways[8]. Policy, again, plays a decisive role here, since data rentiership requires deliberate efforts to convert activities, objects, or interactions into data, and to design mechanisms for extracting economic value from them, meaning that datafication itself requires a highly organized policy process [14]. Financial and corporate logics are what currently drive 'innovation' processes [14]. Data is thus instrumental to financialization processes and, as such, central to the current stage of capitalism.

Fourth, Birch and Chiapetta [14] make a crucial point in this regard: innovation defined in these terms is "[neither] mitigating nor solving the most pressing societal challenges we are facing currently", precisely because such challenges are not the priority, but finance- and market-defined objectives are the true drivers of current innovation policies. Then, the deeper political questions raised by technological mediated processes risk being obscured by the language of data protection and data ownership, as is frequent, respectively, in the health and agriculture sectors.

2. Common EU Data Spaces through the lens of Farmers and Patients

This section first outlines the broader context of the EHDS and CEADS, then examines how they position farmers and patients as rights holders and stakeholders.

2.1. From the EU Data Strategy to the sectoral data spaces

Common EU Data Spaces are devised within the EU Data Strategy as data ecosystems enabling secure and trustworthy data exchange in strategic sectors and

domains of public interest. Sectors such as health, finance, manufacturing, agriculture, defense, tourism, energy, mobility, among other key areas are already developing their own data spaces. Each is built on shared infrastructure and governance, and all share the same horizontal framework; the Data Act (DA) and the Data Governance Act (DGA), while sector-specific legislation can be issued to address the particularities of each domain. The DGA facilitates data sharing, while the DA improves data access, sharing, and interoperability[23][24]. The following sections examine these frameworks in the health and agriculture sectors, focusing on patients and farmers.

2.2. Patients' roles and rights under the European Health Data Space (EHDS)

EU Health: Regulation, sectoral imbalances, and shift to digitalization

In health, EU competence remains limited under Article 168 TFEU, reflecting Member States' resistance to renounce sovereignty over a policy area that is central to the welfare state and remains highly political [25] [26]. Patients' rights therefore are framed largely at the national level, the Charter of Fundamental Rights recognizes a right to preventative healthcare and medical treatment only under conditions established by national law [27]. Directive 2011/24/EU [28], excluded healthcare from the general services market framework established by Directive 2006/123/EC on the grounds that patients are not ordinary consumers, since they need care and their health is in danger [29].

Arrow identified patients' structural information asymmetries and inability to assess care, justifying their special protection [30][31]. The same logic of heightened protection extends to the realm of data protection. Health and genetic data are correspondingly treated as special categories of personal data under Article 9 GDPR [32], prohibited from processing unless any of the exceptions apply precisely because their use can create significant risks to fundamental rights [33].

The COVID-19 [35] acted as a catalyst for a new phase of integration, the European Health Union (EHU), launched in 2024[36]. The EHDS is described as a central building block of the EHU, establishing rules for sharing electronic health data for healthcare (primary use) and broader reuse for policy, research, and innovation (secondary use).

Patients' roles and rights in the EHDSR

The legal basis of the EHDSR reflects the very tension outlined in Section I. It is anchored, on the one hand, on Article 16 of the Treaty on the Functioning of the European Union (TFEU), which establishes the fundamental right to the protection of personal data, and, on the other, on Article 114 TFEU, which aims to ensure the functioning of the internal market [37]. This dual legal basis has attracted considerable academic attention. Tommaso Fia, for instance, argues that the EHDSR should not be understood as a purely economic or market-oriented regulation, since it incorporates the protection of fundamental rights as one of its central normative pillars [38]. By comparison, authors such as Farid Mahsouli [39] emphasize the inherent difficulty of

reconciling these two legal and policy objectives, which leaves the initiative on an ambiguous grounding.

Patients' rights and consent under the EHDSR

The stated aim of the Regulation is to improve individuals' access to and, importantly, 'control' over, their electronic health data. This is where the concept of datafication becomes relevant: the Regulation only becomes applicable once the process of abstracting healthcare information or bodily characteristics into data has already begun. Consequently, the prior decision of whether a person's healthcare information or bodily characteristics should be transformed into electronic health data falls outside the scope of the individual's control under the Regulation.

The EHDSR expressly states that it applies without prejudice to the rights of data subjects established under the GDPR. The scope of these rights, and the extent to which they actually guarantee patients 'control' over their health data, is central to the present discussion. Here the rights to access, portability and consent for data sharing, as established by the GDPR and complemented by the EHDSR, are discussed below.

First, the EHDSR ([37]) complements the right of access as provided under the GDPR [32], specifically with regard to health data, by mandating free-of-charge and immediate access, limited to certain categories of data and exercised through an electronic health data access service ([37]). Second, the right to data portability is also integrated, allowing individuals to access and share certain categories of electronic health data, through mechanisms for data sharing that require interoperability of digital systems at EU level [37]. Notably, Article 99 EHDSR even establishes fines for non-compliance with these rights [37].

Third, and more significantly, the consent regime has undergone an important shift. Although early drafts of the EHDSR did not provide for consent to health data exchange, opting instead for mandatory anonymization of health data, the default has since moved away from the traditional opt-in model, used both for informed consent in the medical context and for the processing of personal data under the GDPR [32], towards an opt-out mechanism, under which data is exchanged by default, unless the patient indicates their will not to participate in the sharing mechanism [37]. The rules and safeguards governing this opt-out mechanism are left to be established by Member States([37]), so it can be anticipated that its implementation will diverge across countries in terms of scope, procedure, and effective accessibility.

It is worth recalling that behavioral economics has extensively documented the strong influence that default settings, such as the opt-out mechanism, exert on individuals' choices [40]. Most citizens, accordingly, are likely to remain within the default option, due to the operation of cognitive biases and heuristics such as loss aversion and inertia. The rationale behind the opt-out can be inferred from Recital 53 EHDSR, which aims to achieve as much completeness of datasets as possible in order to secure their representativeness [37]. Additionally, data protection concerns are meant to be mitigated by anonymizing or pseudonymizing datasets prior to exchange.

Unfortunately, Article 71 EHDSR does not offer a more nuanced opt-out. The consent mechanism is framed in binary terms, patients may opt out from the secondary use of health data, rather than selecting specific purposes or categories of secondary use, such as AI training conducted by companies, while remaining within the system for other purposes (e.g. scientific research or public health uses) [37].

This safeguard, however, is not sufficient on its own: the opt-out can be overridden [37], as Member States may legislate exceptions allowing public sector bodies to access data notwithstanding the exercise of the opt-out mechanism, provided the data cannot be "reasonably" obtained by alternative means. This exception is available only for purposes falling under public interest in public health protection, policymaking and regulation, official statistics, and scientific research for reasons of public interest; however, since 'public interest' is left undefined, its practical scope will depend on how broadly or narrowly each Member State decides to interpret it. A clear power asymmetry remains between individuals and citizens at large, on the one hand, and public authorities, on the other. Recital 61 EHDSR adds to this lack of clarity by indicating that public sector bodies and Union institutions, bodies, offices and agencies might need to have "regular access to electronic health records over an extended period of time"[37]. In the cases this extended access materializes, the principles of data minimization, purpose limitation, and, in particular, storage limitation, may be at risk, a concern especially pressing given the inherent sensitivity of health information. Additionally, the regime applicable to further reuse and sharing of datasets collected before the entry into force of the legislation remains unclear. Patients should now therefore be adequately and confidently informed both the scope and limits of this right, about how to actually invoke it, and its exceptions.

As a final remark: several aspects of the EHDS's operation, such as the granularity of the opt-out, the anonymization and pseudonymization of data, and the safeguards applicable to special categories of data, will be regulated at Member State level, without a high level of harmonization. It is therefore to be expected that patients' position will vary significantly between countries, including in the practical exercise of their EHDSR rights over their own data; a divergence that can be explained as well by EU's limited competence in the field of health.

Questions arise as to whether the Regulation's stated ultimate goal, namely, increasing patients' control over their health data, is actually aligned with the scope of the rules and incentives it creates, given the limited scope of patient consent over the use and sharing of nothing less than their health information, together with the multiple exceptions the EHDSR provides for overriding the opt-out once exercised.

Patients' role in the EHDS

Patients have very little influence over the decisions that determine whether, how, and for what purposes their health information becomes part of the European data sharing infrastructure in the first place.

The task commended to the Health Data Access Bodies (HDABs) under the EHDSR is considerable. They: i) decide on health data access applications and grant access permits; ii) pseudonymize and anonymize data, and prepare and combine the datasets they receive; iii) take measures to protect IP rights; iv) must publicly disclose the conditions for secondary use of electronic health data, with particular attention to the rights and safeguards of natural persons; v) report on health data access applications; and, importantly, vi) impose administrative fines in cases of infringement [37]. Ultimately, it falls to the HDABs to ensure that the EHDS actually operates in the 'public interest'; however, they have on their hands a highly complex and demanding mission, requiring the adequate assessment of legal requirements and ethical considerations in every decision on health data access [42], balancing in practice fundamental rights and business interests.

Expertise and the effective inclusion of patients' interests are therefore crucial, yet patients' influence remains quite limited, since they are not represented on the HDABs themselves. While HDABs are required to cooperate with stakeholder representatives, among whom patient representatives are included, patients have no seat on the EHDS Board, the political body responsible for "facilitating cooperation and the exchange of information among Member States and the Commission." [37]. Patients' role is then relegated to representation within a stakeholder forum tasked with "facilitating cooperation and the exchange of information" among a composition of stakeholders appointed by the Commission [37]. This raises the question of whether patients' participation is actually operative and direct, or merely symbolic, enhancing the structurally weak bargaining position that patients occupy in healthcare but now in relation to their own health data.

It is also worth noting in relation to secondary use of health data, particularly in Recital 61 [37], an effort appears to have been made to avoid the terms 'business', 'commercial' or 'for-profit' when indicating who may be granted access to the data. These purposes are instead discreetly folded into the term 'innovation' or 'innovators' used extensively throughout the Regulation. This choice of language appears to lend an air of neutrality to secondary use, even though market logic is arguably the principal purpose of the EHDSR. A related point, found in the same provision, is that the EHDSR now defines the training of AI algorithms for healthcare as an activity falling under 'scientific research'. This echoes what Lorenzini et al. describe as the 'magical theory of AI', the assumption that developing AI is inherently desirable because it will automatically produce, in this case, better healthcare, a narrative that tends to obscure the more grounded promises, benefits, and pitfalls of AI [43].

The same recital also states that the secondary use of health data should benefit society by bringing new medicines, devices, and healthcare-related products and services to EU citizens at 'affordable and fair prices' [37]. Although this is a noble aspiration, one which we would hope results from the process of data sharing, the operative articles of the Regulation contain no corresponding obligations or concrete mechanisms to that effect. It therefore remains, above all, a political aspiration rather than a public policy objective or a market intervention backed by clear indicators and monitoring. Terms such as 'general interest of society' and 'benefiting society' [37]

remain undefined, yet are used to justify the exchange of health data without meaningful distinctions in terms of consent, safeguards, or access conditions, whether between traditional health research or AI training carried out by a start-up. As things stand, both examples fall under the umbrella of 'scientific research' despite the very different nature of the actors involved, the risks to which patients may be exposed, and the benefits that patients might realistically expect in return.

In sum, patients are the source of health data, yet they are not meaningfully included within the governance and decision-making process. Nor can one speak of real transparency in this process when citizens have no visibility into who accesses their medical information, even where that information has been anonymized or pseudonymized.

More than a fundamental-rights instrument, the EHDSR is clearly oriented toward promoting economically and corporately led innovation, to the extent to which health data has been conceived, first and foremost, as a strategic economic resource for Europe. In this line of reasoning, the secondary use of health data is clearly oriented toward 'innovation' and 'innovators' as defined by for-profit and rent-seeking actors operating outside healthcare and health research. Added to this, as the system shifts from individual consent to public authorization, we can see an expansion of the power of state bodies to access and reuse health information. The discussion on secondary use should therefore not begin by asking how patients can exercise their data rights, but rather, take a step back, and ask more fundamental questions: which interests stand to gain a clear and direct benefit from secondary use? Who is defining 'innovation', and who actually has a voice, and the capacity to profit from this project?

2.3. Farmers' roles and rights under the Common European Agriculture Data Space (CEADS)

EU Agriculture: Regulation, sectoral imbalances, and shift to digitalization

Agriculture is a highly integrated EU policy area, with the CAP evolving from supporting farmers and food security toward a more market-oriented model under pressure from GATT-WTO agreements and reforms such as the Lisbon Treaty[45] [46]., where market orientation has always coexisted with state intervention [44]. In general terms, the CAP offers a large system of subsidies that strongly shapes production and prices[45], the underlying premise is that farmers require support since typically earn less than other EU workers [51].

Intervention in this sector has consistently been justified imperfect information, environmental externalities, and concentration on both the input and output sides of the market [47]. Such concentration has generated bargaining-power asymmetries leading to unfair trading practices (UTPs) affecting small and medium-sized farmers, particularly dependent on know-how or technology [48][49].

CAP's objectives and recent EU Commission political guidelines have progressively expanded to encompass sustainability and digital innovation [52], here precision

farming, automation, IoT, sensors, satellites, AI, and data-sharing as key to efficiency, resilience, and to the development new business models [54] [55].

Farmers' roles and rights in the CEADS

The Common European Agriculture Data Space (CEADS) was devised by the EU Commission under the EU Data Strategy. It has been conceived to enable the "precise and tailored application of production approaches at farm level" to leverage data for sectoral competitiveness and sustainability, and to strengthen monitoring capacities and government services [3]. Following the EU Data Strategy, CEADS was launched in 2025, co-founded by the Digital Europe Programme and coordinated by ILVO[1], with a consortium currently comprising 36 partners from 15 countries [5].

This EU initiative does not create a single marketplace or data-exchange platform; rather, it aims to achieve a secure, interoperable, and federated data-sharing ecosystem for the agri-food sector, connecting existing regional, national, and sectoral projects and platforms. Its goal is to bring farmers, companies, researchers, and public authorities together under shared governance rules and interoperability standards, by combining and sharing data on farm production, supply chains, private platform data, earth observation, and meteorology, while nominally maintaining participants' control over their own data [5].

Farmers' roles in the CEADS

CEADS adopts an open and progressive participation model, meaning that stakeholders can engage with the project according to their respective roles, capacities, and level of readiness by contributing data, services, or specific use cases [5]. Within this framework, Data Sharing Initiatives (DSIs) are identified as the primary building blocks of CEADS, as the objective is to interconnect existing local and sectoral initiatives through common rules and standards to foster data exchange. Importantly, participation in CEADS is structured around predefined roles, making it essential to examine how each category of stakeholder is envisioned within this data-sharing system and what rights, responsibilities, and opportunities are derived from their participation.

The AgriDataSpace project from 2020 to 2022 was a preparatory project identifying the building blocks for deploying the CEADS. Within this project, the landscape, stakeholders and their roles were mapped, setting up a key starting point for analyzing projected farmers' participation in this data ecosystem.

Under the design of the AgriDataSpace, farmers and agricultural producers are assigned three primary roles: using digital services, generating data on their practices and production, and granting consent or permission for the use of data generated on the farm. As an incentive, they receive in exchange money or a service-based compensation, such as "improved tools, interoperability and portability, reduced administrative burden, 360° vision, etc. [6]" In contrast, the remaining stakeholders —

[1] Flanders research institute for agriculture, fisheries, and food.

such as technology and data providers, financial and insurance services, business and industry actors, and government and regulatory bodies—, are primarily pictured as data users (some are also expected to act as data providers), leveraging data as an asset in their own capacities: that is, for developing new business models based on data, creating new services for the sector, and enabling financial risk assessment and product customization [6].

Taken together, the role assigned to farmers in the roadmap for CEADS's continues to cast them primarily as data providers or data generators, meaning that their participation is deemed essential mainly because they supply information on farm and food production. However, recalling the discussion presented in section 2, farmers are not considered 'innovators': there is no explicit provision for them to participate actively in key stages of the datafication process, such as the transformation of data into value, the definition of governance rules, the design of use cases, business models, and the monetization stage. This approach reflects a perspective, according to which farmers' influence should remain largely indirect, limited to participation through representative mechanisms rather than direct decision-making over data generation, processing, reuse and sharing, "to create a 'feeling of control', which would enhance trust and adoption of digital technologies"[57]. By contrast, the other stakeholders in the sector are assigned well-defined functions through which they can derive clear and direct benefits from the data generated in agriculture.

What matters is that farmers, as relevant stakeholders in this type of initiative, can meaningfully and actively define the end goals of datafication initiatives, participate (rather than merely be represented) in governance and value generation, and receive a fair share of the value created. However, the absence of this engagement from the overall EU data-sharing design suggests that this is innovation decided about these actors, but without them, shaped by market logics in which farmers are not directly involved in defining either their own participation or its outcomes.

Farmer's data rights in the CEADS

For this category, the analysis focuses on the Data Act and the rights and obligations it establishes for farmers regarding access to and sharing of data by connected products. Within Chapter II of the Regulation, three provisions are particularly relevant: the obligation of data access by design under Article 3; the obligation of data availability upon user request under Article 4; and the obligation to share data with third parties upon user's request under Article 5.

Although the Data Act seeks to reduce data lock-in by establishing the aforementioned rights, significant gaps remain for the agri-food sector. First, these rights apply only to data generated by connected products and related services, leaving other farm data processed through other interactions outside of the Regulation's scope and locked in within the platform provider [58]. Second, the Data Act takes a user-centric approach to the exercise of the rights, which may not be adequate for the sector, particularly when dealing with non-personal data. In practice, shared use of agricultural machinery and cooperative arrangements make it difficult to identify the user entitled

to exercise the rights granted under the Data Act [58] [59]. Consequently, many farmers may remain unable to access data generated through their activities, while other actors in the value chain continue to collect, aggregate, combine and generate economic value from those data.

Third, the Regulation does not expressly indicate that these rights are inalienable or non-waivable; however, given that the agri-food market is characterized by significant bargaining power asymmetries, this omission might allow dominant players to contractually take control over data or prevent farmers from exercising their legal rights. Finally, the Data Act exempts SMEs from certain obligations, including access by design and data sharing by request provisions [24]. As a result, farmers cannot invoke these rights against small agri-tech providers, even where such providers effectively lock in their data [58]. While relieving SMEs from a disproportionate regulatory burden is a legitimate objective, as demonstrated by the experience of the GDPR, this should not come at the expense of users' legal protection. Otherwise, the availability of the legal data rights becomes derived from the size of the provider, creating unequal protection for farmers, and even potentially creating an incentive for farmers to contract with larger providers only to benefit from the safeguards created by the Data Act.

In sum, this analysis reveals important gaps in the Data Act that leave farmers insufficiently protected in the exercise of the rights it established. While the Data Act aimed to tackling lock-in effect, its user centric approach, limited material scope, and limited protections against contractual imbalances do not see to fully account for the particular protections farmers and their data require in the agri-food sector, and, inadvertently entrenching asymmetries, and dependencies between them and dominant actors.

Beyond the analysis of the Data Act provisions, a broader examination of the relevant legal and policy documents, shows additional structural tensions in the development of CEADS. Lara Ruiz and Gallardo-Cobos [9] adding as well empirical analysis of European and Spanish agricultural data space initiatives, identify the following structural tensions relevant to this article. First, they highlight the difficulties of implementing an increasingly ambitious and complex regulatory framework, where administrative and legal compliance costs may disproportionally affect smaller actors [59]. Second, they point to the risk of platform monopolization; despite the data sharing rights introduced by the Data Act, dominant actors may continue to retain control through their technological infrastructure and consolidated data advantages. Third, they identify a persistent gap between the EU's innovation agenda and questions about the social distribution of value and benefits generated by the so-called 'data-driven' agriculture.

Interestingly, a fourth threat to farmers' rights, mirroring concerns raised in the context of the EHDS, is the effective anonymization of agricultural data, aimed at preventing the re-identification of farmers, which remains insufficiently explored, particularly when it comes to georeferenced data [9]. More specifically, this reveals the blurred boundary between non-personal and personal data in the agricultural sector, and

the challenges that large-scale data sharing and datasets combining pose for protecting individuals.

The findings of Lara Ruiz and Gallardo-Cobos [9] also point to evidence of value concentration in platforms, to the detriment of data generators i.e., farmers. Access rights, without a corresponding effort to address power asymmetries, fail to grant farmers effective autonomy and decision-making power over the datafication of their farms and economic activity, as well as over the processing of their data and the further generation and monetization of value derived from it. In other words, unless power asymmetries are addressed when developing innovation policies, data rights, such as access or portability, risk becoming merely formal, offering no effective systemic protection to individuals or societal groups, and instead reinforcing inequalities towards dominant or vertically integrated market actors, including agricultural machinery manufacturers, digital farming and precision agriculture platforms, digital service providers, and other firms that control key global data or sectoral infrastructures.

3. Farmers and Patients: How are they positioned under CEDS?

The Common EU Data Spaces initiative does much more than build large European data-sharing ecosystems. It determines which objects and beings, and their interactions with people, institutions, or technologies, are to be transformed into data of relevance to each of the most strategic sectors for the EU.

Following the robust multi-level model proposed by Lara Ruiz and Gallardo-Cobos [9] to understand the actors, power dynamics, and tensions shaping CEADS's design, we observe that the same analysis applies equally well to the EHDS, revealing structural similarities between the two data spaces, similarities which, in principle, can also be transferred to the dynamics of other data spaces. The model is composed of: a governance layer, composed of regulation and soft-law instruments (Level 0); data originators, here named 'data generators' (Level 1); data transformation and intermediation actors, that is, the initiatives themselves, providers of data-intermediation services, connectivity and cloud providers, IoT operators, among other actors (Level 2); and value capture, comprising a wide set of data users and re-users, mostly for-profit actors (Level 3).

Level 1 actors are the ones producing the 'raw material' necessary for the functioning of the exchange scheme and its data-based business models; however, as the authors note, they remain quite distant both from the decision-making roles taking place at Level 0, and from the processes of transformation, value generation, and commercialization of products and services based on their aggregated data, which take place at Levels 2 and 3. Both CEADS and EHDS share this pattern: patients and farmers seem to being relegated to the role of primary data generators at Level 1, that is, to generating data under the conditions set by the governance models defined at Level 0, namely the EHDSR and the agricultural frameworks established at EU and national level. Level 2, meanwhile, is composed of transformation and intermediation actors whose role is characterized by a high degree of technical expertise and specialized knowledge, functions that patients and farmers generally do not perform themselves.

Level 3, in turn, comprises a heterogeneous set of data users, both for-profit and not-for-profit, including not only regulators and policy-makers, but also, agri-food companies, medtech firms, AI developers, and pharmaceutical companies.

Additionally, granting data rights, particularly access and portability, and ensuring legal compliance does not necessarily translate into a 'fair and equitable data-sharing' ecosystem. As a central contribution, this article argues that addressing power asymmetries requires actively designing for a system in which: (i) in which each of the intended participants has the possibility to decide whether or not they wish to be part of the transformation of their lives and activities into data; (ii) all willingly participating actors can share in the economic benefits generated from data; (iii) incumbents and large technology firms do not see their power and market advantages further entrenched by these schemes; and (iv) SMEs, new entrants, and grassroots actors have a genuine opportunity to shape innovation, according to their own interests and capacities.

In that sense, we should fear of data spaces becoming "technically sophisticated but substantively inequitable governance arrangements" [9]. However, it is fair to say that both initiatives are still at an early stage of development and remain iterative projects that can still correct imbalances between stakeholders.

Finally, both farmers and patients are, for the most part, positioned as data originators or generators in the CEDS project. They are not envisioned by design to be actively involved in the levels concerned with decision making over the transformation of their life and activities into data, value generation, or generating revenue from the commercialization of data-based products, services or devices. Decisions over governance, intermediation, and value capture are, by design, allocated to other stakeholders, while corporate interests prevail. Then again, we see that this framing is a political choice, one in which 'innovation' is becoming more closely aligned with market logics, reinforced by trends within the respective sectors. It is therefore argued that the structural positioning of data generators is not unique to agriculture or health but rather reflects sectoral asymmetries indicative of a broader pattern in the design of initiatives that fundamentally regard data, and the interactions from which it has been abstracted, as a source of economic value.

4. Conclusions

Drawing on critical scholarship, we can see how CEDS exemplifies a new generation of EU industrial policies that build on datafication to extract economic value from everyday activities, animal life, bodies, soil, and labor. It is worth noting that data sharing might bring benefits to medical research, to public health, The capture, processing, and sharing of data can undoubtedly bring benefits to the health and agricultural sectors, for instance, in strengthening the region's resilience and preparedness in the face of emergencies, and in addressing climate change. Yet these benefits do not fully account for the specific way in which innovation has been defined and pursued in CEDS. The foundations of these policies reveal that innovation has not been framed in a neutral manner: EU Commission narratives promise that technology will be developed with people's interests at the center, and that data-driven innovation

will generate substantial benefits for citizens [3]; yet the underlying construction of data-driven innovation is built around market logics, echoing, in particular, the interests of large incumbent and technology companies.

Despite the differences between the sectors and the datafication processes in the health and agricultural sectors, the analysis of policy and legal instruments reveals that patients and farmers are viewed primarily as data-generating agents, essential to the functioning of this data exchange framework. However, given how the system's structure has been designed, both societal groups are granted narrow, somewhat formal rights, insufficient to counter the power asymmetries of their respective sectors, or to exercise effective control or decision-making power over the datafication process, a process from which other stakeholders stand to benefit more. Second, beyond the individual level, their capacity as a group to defend their own collective interests remains constrained in both data spaces, where, once again, the other participating actors seek to earn their 'trust' so that they generate the currency of exchange for the system, while their participation remains representative, almost symbolic, without the possibility of exercising greater influence over the key aspect of this initiative: the generation of economic value from data.

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