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Review of codes of conduct, voluntary guidelines and principles relevant for farm data sharing

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Table of contents

Introduction

Codes of conduct, voluntary guidelines, sets of principles on how to transparently govern farm data are a recent thing. While laws and regulations that govern personal data are becoming more and more common, legislation still does not cover data flows in many industries where different actors in the value chain need to share data and at the same time protect all involved from the risks of data sharing. Data in these value chains is currently governed through private data contracts or licensing agreements, which are normally very complex and on which data producers have very little negotiating power. Codes of conduct have started to emerge to fill the legislative void and to set common standards for data sharing contracts: codes provide principles that the signatories/subscribers/members agree to apply in their contracts.

Farm data is an example of such sensitive data flows. Farm data flows go from the farm to many other actors (extensionists/advisory service providers/ag tech companies, farmers' associations, financial service providers, government…) and then – aggregated and combined and in the form of services – back to the farm. Such flows potentially open up data that should only be shared with specific actors at specific conditions or should be anonymised in order not to harm the farmer's interests and privacy. This is especially true in the case of smallholder farmers whose farm data often coincides with household data and personal data and who are in the weakest position to negotiate their data rights.

This review of existing codes of conduct, voluntary guidelines and principles relevant for farm data sharing, which we will hereafter just call "codes" for ease of reference, is produced in the context of a consultative process taking place in the GODAN Sub-Group on Data Codes of Conduct[1] and around a planned global collective action on Empowering Farmers through Equitable Data Sharing[2]. Therefore, the review includes codes that revolve around farm data and only tangentially codes that broadly cover agricultural data: general ag (agricultural) data codes potentially include flows that do not concern the farmer (government statistics, research data) and are only partially relevant to our focus. However, we include points also from such broader codes if useful.

In this review, the definition, including rationale and scope, of what a farm data code of conduct is, is based more on what the existing codes are and contain than on an abstract description. This is why we start with a structured description of each code highlighting the aspects that help us define the scope, characteristics and target audience that such a code normally presents. Key points from the review build on the content of a previous review ("*What's behind the ag-data logo? An examination of voluntary agricultural-data codes of practice*", see [1]) published in the International Journal of Rural Law and Policy in 2018.

[1] https://www.godan.info/working-groups/sub-group-data-codes-conduct
[2] https://www.gfar.net/documents/vision-and-strategic-plan-collective-action-empowering-farmers-through-equitable-data

In addition, we also consider what such a code should cover to better empower farmers with more equitable data flows. The review tries to draw some conclusions on commonalities and differences between the existing codes, in order to then extract and recommend the essential aspects and points for a general, scalable and further customizable code of conduct template that best addresses the needs of the farmer.

An interesting point from our farmer-oriented perspective is that, as the review shows, the existing farm data codes do not have farmers or farmers' organisations as their primary target audience – not to mention smallholder farmers – but rather the agribusinesses and ag tech companies that work with farmers and use their data. Codes are an instrument for these companies to ensure data sharing by gaining the trust of farmers through transparent documentation of good practices. So, while being prepared by bodies that represent also farmers (so far, big farmers' associations of developed countries) and indirectly raising farmers' awareness of their data rights, they are not written primarily for farmers and, so far, surely not for smallholder farmers.

Therefore, from our perspective, this review also has a further practical purpose: providing the conceptual basis for general scalable guidelines for associations of smallholder farmers in developing countries on how to use/adjust/negotiate/set up a farmer-centred farm data sharing code. A key point of our guidelines is the essential role of trusted organisations, like farmers' aggregations, in interpreting/contributing to/negotiating the code for their farmers.

1. Key points about the most relevant codes

1.1 US American Farm Bureau Federation's Privacy and Security Principles for Farm Data

Link	https://www.fb.org/issues/technology/data-privacy/privacy-and-security-principles-for-farm-data
Year	2014
Author/ publisher (body)	US American Farm Bureau Federation.
Publisher type	Federation of "commodity groups, farm organisations, and agriculture technology providers".
Target audience	Ag Tech Providers (ATP).
Rationale/ objectives	There is no background in the document itself. The Ag Data Transparent website explains: "*In 2014, American Farm Bureau Federation (AFBF) observed that many of its farmer-members were concerned about the variety of new ag data products that were arriving on the market. What would happen to ag data once provided to these platforms? Would the tech providers use this data for their own purposes? Could the farmer ever get this data back?*"[3]
Scope/types of data	"Precision agriculture and farm data".
Summary	The American Farm Bureau Federation's Privacy and Security Principles for Farm Data ('Principles for Farm Data') sets out core principles around consent and disclosure and aims to ensure that the ag data is not misused. The voluntary Principles for Farm Data also provide companies (ATPs) which collect and analyse farm data with guidelines when constructing their contracts and technologies.
Key points	1. **Education**: *grower education is valuable to ensure clarity between all parties and stakeholders.* 2. **Ownership**: *we believe farmers own information generated on their farming operations. However, it is the responsibility of the farmer to agree upon data use and sharing with the other stakeholders with an*

[3] https://www.agdatatransparent.com/about

	economic interest, such as the tenant, landowner, cooperative, owner of the precision agriculture system hardware, and/or ATP etc. 3. **Consent for collection, access and use**: *an ATP's collection, access and use of farm data should be granted only with the affirmative and explicit consent of the farmer.* 4. **Notice and transparency**: *farmers must be notified that their data is being collected and about how the farm data will be disclosed and used. ATPs shall notify farmers about the purposes for which they collect and use farm data.* 5. **Choice**: *ATPs should explain the effects and abilities of a farmer's decision to opt in, opt out or disable the availability of services and features offered by the ATP.* 6. **Retrieval and portability**: *within the context of the agreement and retention policy, farmers should be able to retrieve their data for storage or use in other systems, with the exception of the data that has been made anonymous or aggregated and is no longer specifically identifiable.* 7. **Third-party disclosure and sale limitation**: *an ATP will not sell and/or disclose non-aggregated farm data to a third party without first securing a legally binding commitment to be bound by the same terms and conditions as the ATP has with the farmer.* 8. **Data retention and removal**: *each ATP should provide for the removal, secure destruction and return of original farm data from the farmer's account upon the request of the farmer or after a pre-agreed period of time.* 9. **Contract termination**: *farmers should be allowed to discontinue a service or halt the collection of data at any time subject to appropriate ongoing obligations.* 10. **Unlawful or anti-competitive activities**: *ATPs should not use the data for unlawful or anti-competitive activities, such as a prohibition on the use of farm data by the ATP to speculate in commodity markets.* 11. **Liability and security safeguards**: *the ATP should clearly define terms of liability.* *Quotes from [2]*
Compliance/ certification	Ag Data Transparency Evaluator A process was launched in 2016 to certify those ATPs whose contracts complied with the Privacy and Security Principles for Farm Data. The Certification tool is called Ag Data Transparency Evaluator[4] and is available to ATPs to *voluntarily* submit their data contracts to a simple *10-*

[4] https://www.agdatatransparent.com/

	question evaluation. It was created by the American Farm Bureau Federation and is backed by a consortium of farm industry groups, commodity organisations and ATPs. 1. The Evaluator allows ATPs to assess themselves against the Privacy and Security Principles for Farm Data and, in doing so, bring transparency, simplicity and trust into the contracts that govern precision agricultural technologies. 2. Answers to the ten questions, plus the ATP's contracts and policies are submitted to and reviewed by an independent third-party administrator (the law firm of Janzen agricultural law llc.). 3. Once reviewed, the results are posted on the Ag Data Transparency Evaluator website for farmers and other ag professionals to consult and review. 4. If an ATP's submission is successful, they can use the 'Ag Data Transparent' seal. a. The seal informs farmers whether the approach taken by the technology provider is in line with the Principles for Farm Data. b. It is hoped that the ability to use the seal indicating that the business is ag data transparent provides an incentive for the ATPs to review and improve their contractual terms related to ag data.
Standards	
Review notes	*This review is based on [1]*

1.2 New Zealand Farm Data Code

Link	http://www.farmdatacode.org.nz/
Year	2014
Author/ publisher (body)	DairyNZ (through the Transforming the Dairy Value Chain programme), the Red Meat Profit Partnership and the Ministry of Primary Industries through the Primary Growth Partnership.
Publisher type	National dairy farmers' association, meat processors' association, Ministry.
Target audience	"For organisations that collect, store and share primary production data".

Rationale/ objective	To establish a "set of guidelines enabling effective sharing of data within the New Zealand agriculture industry" (see [3]). "Organisations complying with the Farm Data Code of Practice give primary producers confidence that their information is secure and being handled in an appropriate manner."
Scope/types of data	The scope of the NZ Farm Data Code *extends to all farm data, which is recognised under the scheme to include non-personal information as well as personal information.*
Summary	The NZ Farm Data Code was funded by DairyNZ (through the Transforming the Dairy Value Chain programme), the Red Meat Profit Partnership and the Ministry of Primary Industries through the Primary Growth Partnership. The Farm Data Code of Practice is one of three data integration initiatives driven by the pastoral sector on behalf of farmers. The Farm Data Standards and the Data Linker are complementary tools aimed at getting data moving across the primary sector – securely, efficiently and within a transparent framework.
Key points	The Code is strongly focused on the importance of disclosure of rights, rules and processes for data sharing. Key points: ● **Disclosure about rights**: *make disclosures to primary producers* and other end users *about the rights* that the parties have in: *the data; rules and processes for data sharing; data security and; the legal jurisdiction in which data is kept.* ● **Disclosure about practices**: organisations agree to disclose their practices and policies around: data rights, data processing and sharing, and data storage and security. ● **Security**: implement a set of practices that *provide primary producers with confidence that data pertaining to their farming operations is secure*. ● **Purpose limitation:** implement a set of practices that *provide primary producers with confidence that data pertaining to their farming operations is managed according to agreed terms and for agreed purposes*. ● **Access limitation**: implement a set of practices that *provide primary producers with confidence that data pertaining to their farming operations is accessible under appropriate terms and conditions*. *Quotes from [3]*
Compliance/ certification	1. Agribusinesses conduct a *self-audit* in which they determine if they comply with the code. To do this, agribusinesses are provided with a

	compliance checklist, and must answer various questions drawn from the key topics of the NZ Farm Data Code, including: a. *disclosure of rights to data* b. *security standards* c. *access to data by third parties.* 2. Agribusinesses must provide a *statutory declaration* to confirm that they are compliant with the NZ Farm Data Code. 3. Finally, a review panel carries out an assessment of the application to 'assess the compliance checklist and evidence provided and make a recommendation to Farm Data Accreditation Ltd'. Farm Data Accreditation Ltd is an *independent company* that has been established in order to own and operate the NZ Farm Data Code. 4. Agribusinesses that comply with the code's standards are authorised to display the code of practice mark on their website and documents. a. Accreditation of the NZ Farm Data Code is essentially a form of self-regulation in which companies conduct a 'self-audit' and statutory declaration to confirm that they comply with the NZ Farm Data Code. b. Once companies have done this, their application is assessed and, if approved, they will receive an annual licence and certificate as well as the NZ Farm Farm Data Code trade mark to use.
Standards	A set of technical Farm Data Standards[5] have been developed with the hope of assisting data sharing across the dairy sector. These standards provide '*a set of common data vocabularies that assist the business and industry organisations that serve NZ farmers to develop efficient technology applications and integrations*'. So far, there are standards for animal data, land application data, financial data, irrigation and effluent data, stock reconciliation data, farm features and attributes data, pasture, grazing and feed data, farm and model data, and health and safety data.
Review notes	*This review is based on [1]*

1.3 EU Code of Conduct on Agricultural Data Sharing by Contractual Agreement

Link	https://copa-cogeca.eu/img/user/files/EU%20CODE/EU_Code_2018_web_version.pdf
Year	2018

[5] http://www.farmdatastandards.org.nz/

Author/ publisher (body)	COPA-COGECA, CEMA, Fertilizers Europe, CEETTAR, CEJA, ECPA, EFFAB, FEFAC, ESA.
Publisher type	Regional farmers' association, regional machinery industry association, contractors' association, fertiliser and feed producers' association.
Target audience	It seems addressed to all actors in the agri-food chain.
Rationale	Farmers and agribusinesses will share data "*if the potential benefits and risks are made clear and when they can trust that these are settled in a proper and fair way through contractual agreements. It is therefore crucial to define key principles on data rights, be they proprietary or similar rights, access rights and/or data re-use rights. Transparency and responsibility are key to gaining trust. If such principles are established and followed, then it will be possible to construct business models that benefit all stakeholders involved*" [4]. Promoting the dialogue of all parties involved in the agri food value chain. Data sharing between different stakeholders must be conducted under fair and transparent rules.
Scope/types of data	"*Data related to agricultural production, including farm data and all types of data generated within the farming processes*" [4]. Specified in Annex: farm data (agronomic data, livestock data, compliance data), machine data, service data, agri-supply data, agri-service provider data. The code predominantly focuses on non-personal data (otherwise referring to the GDPR).
Summary	On the 23rd of April 2018 a coalition of nine EU agro-associations (Copa and Cogeca, CEMA, Fertilizers Europe, CEETTAR, CEJA, ECPA, EFFAB, FEFAC, ESA) developed guidelines for processing and sharing agricultural data. The result is the EU Code of Conduct on Agricultural Data Sharing by Contractual Agreement (EU Ag Data Code). The Code is focusing on the contractual relations and provides guidance on the use of agricultural data, particularly the rights to access and use of data. Its scope is to create trust between the partners, set transparency principles and define responsibilities. This code was developed on the basis of the EU legislation, the EU General Data Protection Regulation (GDPR) about personal data.
Key points	● **Definitions**: the Code provides a list of definitions that are relevant and specific to the agricultural sector (e.g., what is considered agricultural data/types of agricultural data, data originator, data provider, aggregated data, etc). Some of the definitions are exactly the same as the GDPR definitions, but applied to farm data (processing, controller, processor).

- **Data originator concept**: the EU code favours the concept of a data "originator" instead of a data "owner". It recognises the need to grant the data originator (the one *who has created/collected the data either by technical means or by himself or who has commissioned data providers for this purpose*) a leading role in controlling the access to and use of data from their business and to benefit from sharing the data with any partner that wishes to use their data. The Code recognises the data originator as the person with the initial rights in the data (rights to access, use and share).
- **Consent for collection, access and use**: it is stated in the code that via contractual arrangement the collection, access, storage and use of agricultural data can be occurred only with the explicit informed permission of the data originator.
- **Retrieval and portability**: the data provider is responsible for making data easily available to the data originator; the data originator has the right to have the data transmitted directly from one data user to another where technically feasible, unless stated in the contract.
- **Right to be forgotten**: right to remove, destroy, erase or return data to the data originator.
- **Right to benefit**: the Code recognises the originator's right to benefit or be compensated for the use of data they originated. The Code also states that, unless otherwise agreed in the contract, only the data originator may authorise transfer of data.
- **Purpose limitation**: no reuse of the data is allowed for different purposes than those that had been originally agreed.
- **The need for simple and understandable contracts**: the Code states that contracts for ag data should use simple and plain language that will clearly specify: (1) important terms and definitions; (2) the purpose of collecting, sharing, and processing data; (3) rights and obligations of parties related to data; (4) information related to storage and use of ag data; (5) verification mechanisms for the data originator; and (6) transparent mechanisms for adding new uses.
- **Pseudonymisation**: the Code states that the data processor should use pseudonymisation unless the parties agree on the terms by which the data originator can be identified.
- **Contract modification and termination**: Data originators must be given the possibility to opt out of the contract and terminate the collection and usage of their data provided that it is stated in the contract and the data originator is informed about the consequences. Besides, "contracts must not be amended without the prior consent of the data originator".
- **Data protection safeguards**: the contract should mention the security and confidentiality responsibilities of the data users/providers.

	● **Liability and protecting IP rights**: terms of liability should be defined. The contract should also acknowledge the rights of all parties to protect sensitive information via restrictions on further use or processing. Protection of trade secrets, intellectual property rights and against tampering should be ensured. ● **Protecting a natural person's privacy**: if companies use ag data "to make decisions about the data originator 'as a natural person'", then the GDPR protections for personal privacy rights apply.
Compliance/ certification	"*Compliance with the code of conduct is voluntary. The signatories therefore encourage all parties involved in the agri-food chain to conform according to these jointly agreed principles*" [4]. The only compliance tool is a "contract check list for agricultural data" with the questions one should ask when using a product or service that captures or uses agricultural data: ● Is there an agreement/contract in place? ● What obligations are there? What warranties and indemnities are there for each party? ● What data is collected? ● Who owns/controls access to the data? What services are delivered? ● Will my data be used for purposes other than providing me, the data originator (e.g. farmer), a service? Is it clear what these are? Can I agree/disagree? What are/is the benefits/value for me (as data originator)? ● Is the data shared with other parties? What rules do the external parties adhere to? Can I agree/disagree with sharing data with other parties? ● Can the service provider change the agreements unilaterally? What happens when the service provider changes ownership? Can I retrieve my dataset from the system in a usable format? Will I be updated on security breaches? ● Can I opt out of the service and have my data deleted from the system? Is there a contact point to assist me with any questions that I may have? Do I need insurance? ● What are the confidentiality terms?
Standards	
Review notes	*This review was prepared by the authors of this document.*

2. An initial review: some reflections about the codes

This initial review is heavily based on [1], which is the most relevant study published on this topic.

2.1 Commonalities between farm data codes

Self-regulatory, voluntary

Currently ag data schemes are a form of voluntary self-regulation that rely on the goodwill and social responsibility of industry and agribusiness. Ag data codes of practice are self-regulatory because they are largely designed and implemented by industry-led groups or organisations that are attempting to influence ag data practices. An advantage of industry-led self-regulation is that it ensures the involvement of experts and facilitates sustained relationships between producers and agribusiness.

Principle-based

A second feature of existing ag-data codes of practice is that they tend to be principle-based and provide a benchmark of what industry regards as 'good' practice in terms of ag data management. This means that they focus on the outcome of ag data practices rather than the exact process or actions by which this is to be achieved. So, rather than dictating exactly how agribusinesses should manage ag data, current codes of practice tend to focus on consent, disclosure and transparency.

Communicative function

Ag data codes are used to communicate that a provider's data practices comply with certain principles. For example, the NZ Farm Data Code has the explicit aim of offering 'visible credibility' for accredited agribusinesses. Whatever details they convey, the communicative function of ag data codes of practice is, in large part, simplification: by adhering to a code, agribusinesses communicate in a simplified way that they adopt a number of principles and best practices.

Scope

While the US code does not explicitly describe the types of data within the scope of the set of principles, the NZ and the EU code do, although at different degrees of detail. The scope of the NZ Farm Data Code "*extends to all farm data, which is recognised under the scheme to include non-personal information as well as personal information*". The EU code covers "*data related to agricultural production, including farm data and all types of data generated within the farming processes*" and more precisely farm data (agronomic data, livestock data, compliance data), machine data, service data, agri-supply data, agri-service provider data. The EU code also clarifies that it focuses on non-personal data (otherwise referring to the GDPR). Irrespective of the explicit definition, it appears that all three codes aim at covering the same types of data: the more comprehensive list of the EU code seems to best describe the scope of all three codes.

Content

As can be seen from the review above, in terms of content, the existing codes revolve around three core common points: *consent, disclosure and transparency*; more in particular, all three or at least two out of three cover these key aspects:

- *Data ownership assertions*
  The EU and US codes consider the farmers as the owners of information generated on their farms and as such entitled to decide on data use and sharing with other stakeholders; they recognise the "data generating" role also of the precision agriculture system, but still considering the farmer as the owner – the "originator" of the data according to the EU code. The NZ code does not assert any ownership rights: agribusinesses have to disclose which rights are asserted on the data.

- *Consent for collection, access and use*
  For the EU and US codes, collection, access and use of farm data should be allowed only with the explicit consent of the farmer and the farmer maintains control of the data down the line, while the NZ code leaves it to the agribusiness to decide and disclose to primary producers what rights the organisation asserts in relation to the data and what rights the primary producer has in relation to the data.

- *Transparency and notice*
  All three codes require that farmers be informed that their data is being collected, for which purposes and how it will be used.

- *Third-party disclosure and purpose limitation*
  All three codes prevent agribusinesses from disclosing non-aggregated farm data to third parties without farmer's consent and without the same bounding legal conditions as the agribusiness has with the farmer. The EU code includes also the purpose limitation principle, by which no reuse of the data is allowed for different purposes than those that had been originally agreed.

- *Retrieval and portability*
  All three codes require that farmers be able to retrieve their data for storage or use in other systems.

- *Data retention and availability; liability and security safeguards*
  All codes stress the duties of the data collector/processor to adopt all measures to make data always available and stored securely and provide liability safeguards.

- *Right to opt out*
  Both the EU and the US codes state that farmers should be allowed to opt out of the agreement and halt the data collection.

Certification
Data certification tools such as the NZ Farm Data Code and US Ag Data Transparent Seal provide an opportunity to develop transparency and trust around data uses. They also provide a chance to develop and implement standards around data management practices.

Uptake
None of the codes reviewed seems to have a significantly broad adoption. To date, only approximately 20 companies and their products have been evaluated and granted approval to use the Ag Data Transparent Seal and approximately five companies have been accredited to use the NZ Farm Data Code mark. There is no accreditation system for the EU code, so there are no clear numbers on its adoption.

2.2 Key challenges for farm data codes

- The need for an *appropriate and agile ag data normative framework*: not only is there a normative gap regarding agricultural data, but the nature of ag data flows would also require an agile cross-national normative framework. Because ag data codes operate not just in the gaps of government legislation but also in coordination with existing legislation, the principles in a code of conduct might overlap or even conflict with existing legislation, particularly privacy and consumer laws, especially in cross-national flows.

- The issue of *stakeholder inclusion and oversight*: on the one hand, there is the question of who is in the best position to design, implement and administer the ag data code and whether agribusinesses should be trusted to police themselves or whether there is a need for greater oversight; on the other hand, there is the key question of the inclusion of all stakeholders from the design phase, especially farmers.

- The challenge of ensuring adequate implementation and *enforcement*: like all voluntary programmes, ag data codes depend on participation from industry, agribusiness and producers. "*It appears that current ag data codes emerged before sizeable demand from producers and agribusiness. There is, therefore, a need to build value in, and awareness of, voluntary ag data codes*" [1]. Other voluntary codes of practice – for example, Forest Stewardship Council (FSC) – are most successful when legal and regulatory obligation exist and are consistent with the standards that government and industry are attempting to implement. This is not the case with ag data. There is little legislation on data practices, which raises challenges for the implementation of such schemes. When examining other certification schemes (such as FSC) and regulatory theory (such as 'smart regulation'), it appears that the government must also play a role in the ag data management and practice.

- The challenge related to the *credibility of self-regulation*: self-regulation is not always considered as a rigorous instrument. *"Self-regulation is frequently an attempt to deceive the public into believing in the responsibility of the irresponsible industry. Sometimes it is a strategy to give the government an excuse for not doing its job"* [5].

- In order to attract members to increase adoption, there is a *risk of watering down the principles* by trying to accommodate the competing interests of different stakeholders.

- The *international dimension*: besides the fact that ag data flows across geographic boundaries, a possible disadvantage of national or regional codes is that they do not ensure a level playing field internationally. Assuming that the code self-regulation covers one country or one region, differential agreements may lead to trade irritants caused by (i) different level of transparency needed for trade (tracking system, quality system); (ii) differential access to information, especially for smallholders; (iii) differential access to information by the industry which will bring differential value to the services rendered to farmers. International sector-specific codes may be a way to address this issue.

3. Guidelines for a code addressing the needs of farmers

These guidelines derive key points from [1], which is the most relevant study published on this topic.

As explained above, this review aims to extract and recommend the essential aspects and points for a general, scalable and further customisable code of conduct "template" that best addresses the needs of the farmer. Based on the vision that a number of partners set forward for a collective action on Empowering Farmers through Equitable Data Sharing, such a code has to enable "*inclusive data ecosystems that nurture equitable sharing, exchange and use of data and information by all and for all participants in agri-food value chains, with special consideration of smallholder farmers, the most vulnerable to inequitable data flows*" [6].

In terms of rationale for a code of conduct on the treatment of data and guidelines on how they should be drafted, it may be useful to also consult the European Data Protection Board's *Guidelines 1/2019 on Codes of Conduct and Monitoring Bodies under Regulation 2016/679* (EDPB Guidelines) [7], which refer to codes of conduct mainly as a mechanism to demonstrate compliance with the GDPR, but provide some useful reflections that can be applied to such codes in general and pretty much align with many of the reasons and recommendations provided below. We quote the EDPB Guidelines in this section where we think that their recommendations are particularly relevant for our objectives.

Another piece of policy that may be useful reference on how concepts of personal data protection may be extended to non-personal data is the recent EU Regulation on the Free Flow of Non-personal Data[6], and its relevance for digital agriculture. The Regulation came into force in May 2019 and it is about the control of non-personal data: it states that the expanding internet of things, artificial intelligence and machine learning represent sources of non-personal data and it explicitly mentions precision agriculture. This highlights the need for more analysis to achieve a clearer distinction on personal versus non-personal farm data, which would help alleviate privacy concerns going forward. Appropriately, the new regulation emphasises the importance of self-regulation within the data economy: it encourages the development of industry-specific codes of conduct, allowing for transparent, structured and seamless sharing of data between service providers.

3.1 Why a code of conduct?

Trust

Digital agriculture and data can make farming more productive and profitable and agri-food chains more efficient and transparent, but the necessary data flows are hindered by the lack of trust between data producers and data consumers in the chain: trust around ag data access and use needs to be fostered. Agreed upon and participatory codes of conduct help build trust.

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1807&from=EN

Normative gaps
Agreed rules foster trust. However:

- Legislation on data sharing (e.g. on data privacy) does not cover farm data (adopting the definition of the EU code, “data related to agricultural production, including farm data and all types of data generated within the farming processes”) and it seems governments are reluctant to legislate on this (see [1]). Legislation is also difficult due to the cross-national nature of certain ag data flows.

- Data in the agri-food value chain is currently governed through *ad hoc* private data contracts or licensing agreements, which are very diverse, not based on any standard, normally very complex and on which data producers (especially smallholder farmers) have very little negotiating power.

Therefore, industry-led self-regulation in the form of codes of conduct or voluntary guidelines can have a role in filling the legislative void and setting common standards for farm data sharing contracts even across countries and regions. The EDPB Guidelines also state that “*Codes can provide much needed confidence and legal certainty by providing practical solutions to problems identified by particular sectors in relation to common processing activities. They encourage the development of a collective and consistent approach to the data processing needs of a particular sector*” and “*Codes may also prove to be a significant and useful mechanism in the area of international transfers*” [7].

Simplifying the assessment of behaviours
Already in a number of sectors in which companies want to demonstrate compliance with social responsibility requirements (like labour rights, sustainability, tourism), self-regulation (codes of conduct with some form of accreditation/certification) is seen as an appropriate instrument of governance. These forms of accreditation ensure the audience that accredited companies behave correctly under specific aspects. In the case of farm data, they reassure producers that data is managed correctly without the need of reading complex contracts. This is especially true if a trusted organisation, like a farmers’ association, handles the hard work of reading/contributing to/negotiating the code for farmers.

Awareness building
Codes of conduct help build awareness on the importance of transparency of farm data flows and related ownership/access rights; they change the way agribusinesses think about data and make data producers, primarily farmers, more aware of their rights. Besides, accreditation systems tend to protect themselves by dealing with those members who do not improve or are not compliant and improving the code itself, thus leading to a general improvement of practices over time.

Participation and inclusiveness
Codes of conduct are normally co-developed by different organisations representing the

concerned stakeholders. They aim at providing principles that have been/can be agreed by all the stakeholders. This fosters trust and increases credibility.

3.2 Recommendations for a farmer-centred code of conduct on farm data

Effectiveness
To be effective, a code should achieve broad adoption and make a real impact on the behaviours of the members.

- **Adoption**
  Adequate implementation and enforcement have to be ensured. It is recommended to highlight the perceived and actual benefits of accreditation for participants (like increased sales and more profits). Also, the legitimacy of the code and of those who administer and accredit compliance is essential (see credibility below). Different actors can help increase the adoption of a code: farmers' organisations could have a role in making adhesion to codes mandatory, e.g., requiring accreditation for any business dealing with their farmers; donors can put pressure for the adoption of codes; advocacy with policy makers might lead to the incorporation of code principles or to the mention of the code in legislation; advocacy at the international level could lead to the consideration of farm-data code principles in international initiatives like the International Digital Council for Food and Agriculture foreseen by GFFA [8] or an International Treaty on Agricultural Data as envisaged in recent literature.

- **Balance between attraction and high standards**
  In order to attract members to increase adoption, there is a risk of watering down the principles by trying to accommodate the competing interests of different stakeholders. Attention should be paid to the balance between high standards and lowering the barrier for adoption/membership. Codes should not be formal checklists, they should really persuade agribusinesses to engage in socially desirable ag data practices.

Credibility
Credibility increases adoption. Self-regulation is not always considered as a rigorous instrument, so clear objectives, real representation, independence and auditing practices are important.

- **Clear direction**
  "Ag data codes must be informed and sustained by clear objectives, and stakeholders must have a clear direction in which they want to take ag data practices. In other words: stakeholders need to be sure about what they are trying, and able, to achieve with their ag data codes of practice" [1].

- **Representation and inclusiveness**
  The EDPB Guidelines prescribe that "*A code must be submitted by an association/consortium of associations or other bodies representing categories of controllers or processors (code owners) [...]. Code owners would include, for example, trade and*

representative associations, sectoral organisations and interest groups" [7]. Ensuring that all concerned stakeholders participate in the development of the code and endorse it contributes to its credibility. *"What is evident from scholarship and commentary on voluntary codes is that it is necessary that multiple stakeholders and industries are involved in designing and implementing them. In terms of ag data, these stakeholders include not only producer groups but also agribusiness and government agencies and research corporations"* [1]. Inclusion of the most vulnerable actors, those who risk the most from data sharing and might therefore be reluctant to share, is particularly important. Having farmers' organisations as the driving force behind the code can ensure that the farmers' perspective becomes central.

- **Independence and external auditing**
  "A fundamental question is whether agribusiness should be trusted to police themselves or whether there is a need for greater oversight. It is generally accepted that the body or organisation implementing and administering an ag data code needs to be independent" [1]. Beyond the creation of the code itself, also the administration and auditing of the code is very important and requires a high level of credibility and impartiality. It is highly recommended that the entity administering the code (doing the accreditation, auditing, etc.) is independent or perceived to be fully representative and impartial.

  Accreditation and certification
  "Some external auditing is necessary to check compliance rather than relying on self-declarations or asserting compliance through advertising or other public relations" [1].
  The EU code only requires agribusinesses to adopt the code, with no accreditation or assessment of the agribusiness practices, while the US and the NZ codes have an accreditation/certification process; accredited businesses can use the ag data logo.
  A data certification scheme can enhance trust because producers are assured that an independent and objective party has evaluated the provider's practices and deemed them worthy of certification. Data certification is not without its challenges, and it is not a one-size-fits-all solution. Certification compared to simple accreditation may require a complex process. A simple accreditation system would be recommended as a first step.

Alignment with the broader ag data normative framework
Since the actors adopting the code work in a broader legislative context, the authors of the codes will have to consider how the principles in the code overlap with existing legislation, particularly privacy and consumer laws. In addition to national laws and regional directives, codes should also consider, and try to align to or influence, foreseeable guidelines developed in international initiatives like the International Digital Council for Food and Agriculture envisaged by GFFA or other future international endeavours.

Farmers' perspective
In the existing codes, it seems the perspectives of certain stakeholders are stronger: the main existing codes have been written mainly to gain producers' trust for agribusinesses, therefore they strongly represent the perspective of agribusinesses (basically, codes include what

agribusinesses are ready to accept). The organisations producing a code should carefully consider the balance of the perspectives represented. In particular, farmers' associations should negotiate for the most vulnerable actors, those who risk the most from data sharing and might therefore be most reluctant to share. Endorsement/co-creation of codes by farmer-led associations can ensure that the farmers' perspective becomes central.

Roles of stakeholders

As noted above, codes of conduct are normally co-developed by different organisations representing the concerned stakeholders. However, there is no established approach regarding who takes the initiative, who participates and how the different views are represented. In general, it is recommended that all concerned actors are represented in the body that creates the code. However, in line with the focus of our collective action on smallholder farmers, it would be recommended that farmer-led associations at least endorse and preferably co-create the code, to ensure that the farmers' perspective becomes central. Beyond the creation, different actors can help increase the adoption of a code: farmers' organisations could have a role in making adhesion to codes mandatory, e.g., requiring accreditation for any business dealing with their farmers; advocacy with policy makers might lead to the incorporation of code principles or to the mention of the code in legislation; donors can put pressure for the adoption of codes. As noted above, the body or organisation implementing and administering an ag data code should be independent, especially if there is some auditing. Regarding the role of farmer-led associations in the development and implementation of codes, summarising from our previous points we would recommend that farmer-led associations co-create the code to ensure that the farmers' perspective becomes central. Even in the cases when a code exists and farmer-led associations adhere later, they can handle the hard work of reading/negotiating the code for farmers. Besides, farmers' associations can have an important role in the audit structures behind the codes.

Scope and content

- **Scope/focus**
  The code should have a clear and precise scope, in terms of types of data that are covered, processing operations, territorial scope. According to the EDPB Guidelines, "*The draft code must have a defined scope that clearly and precisely determines the processing operations (or characteristics of the processing) of personal data covered by it, as well as the categories of controllers or processors it governs. This will include the processing issues that the code seeks to address and provide practical solutions*" and "*The draft code must specify whether it is a national or transnational code and provide details in relation to territorial scope*" [7].

  The major decisions in terms of scope concern:

  - *The types of data covered*
    A new code could just cover the types of data covered by the existing codes (the most comprehensive description being probably in the EU code) or depending on the

actors involved and the objectives also cover additional types of data. The important thing is to clearly define the coverage. It should be decided whether the code covers the whole agricultural data value chain (in a country or across countries, in a sector or across all sectors) or just the farm data value chain. In this review the expressions "ag data" and "farm data" have been used almost interchangeably. The existing codes use the term "farm data" far more often and indeed focus on data collected on the farm and shared with other actors. This would exclude for instance off-farm research data or weather services data where on-farm collected data is not involved. The EU code is the one that defines the coverage of types of data more precisely: "data related to agricultural production, including farm data and all types of data generated within the farming processes" and in the annex more precisely: farm data (agronomic data, livestock data, compliance data), machine data, service data, agri-supply data, agri-service provider data. Depending on the data ecosystem in which the code is going to be adopted and on the actors involved, the scope could be broadened. An example of additional very sensitive types of farm-related data that could be covered by a code (especially if the farm data ecosystem includes financial services, insurance services, subsidies application systems, etc.), are: financial data, land data (ownership, size, land use), trade secrets, etc. The overlaps with legislation on the protection of personal data and trade data as well as on government public records should be considered.

- *The sector and value chain segment*
  Again depending on the data ecosystem in which the code is going to be adopted and on the actors involved, it could be deemed convenient to focus only on a specific sector (e.g., one crop) or one segment of the value chain (e.g., input and crop production, or market, or finance, or just the data flow between farmer and farmers' association...). *"On the one hand, a narrow focus (e.g., focusing solely on the grain sector) may help focus attention and makes it easier to establish the most appropriate ag data principles and practices for the industry or sector; on the other hand, determining an appropriate normative framework is more challenging at a national or whole of agriculture level"* [1]. However, on the one hand the principles in a code of conduct can be easily generalised for all sectors, and on the other hand farm data is so varied and involved in so many intertwined data flows, that defining the boundaries of a detached and precisely delimited sector-specific data system can be difficult and provide little advantage.

- **Principle-based?**
  "Principles are 'general rules … (that) are implicitly higher in the implicit or explicit hierarchy of norms than more detailed rules: they express the fundamental obligations that all should observe' and avoid 'reliance on detailed, prescriptive rules and rel[ies] more on high-level, broadly stated rules or principles"[7]. All the reviewed codes of conduct are more or less principle-based, although with varying levels of detail when it comes to practices. In theory,

[7] Julia Black, 'Forms and Paradoxes of Principles-Based Regulation' (2008) 3(4) Capital Markets Law Journal 425.

the level of detail of codes can vary. *"Codes of conduct can range from vague pronouncements about recognising the importance of ag data to more substantive efforts at shaping the way in which ag data is accessed and used"* [1]. Judging from the existing ag data codes of conduct and from codes of conduct in general, this type of document should be very concise and principle-based: they do not go much into specific and technical prescriptions, but the level of detail varies slightly: for instance, the EU code goes a little beyond principles when it comes to clarifying how a key principle with practical and technical implications should be implemented (for instance giving clear indications around the ownership and access rights across the value chain and down the line). A code should be principle-based but provide enough detail on how the principles should be implemented to allow a basic assessment of compliance.

- **Content**
  What should the content of an ag data code include? As an indication, the EDPB Guidelines provide a possible list of topics that can be covered by codes, like: fair and transparent processing, legitimate interests pursued by controllers in specific contexts, the collection of data, the pseudonymisation of data, the information provided to individuals and the exercise of individuals' rights, technical and organisational measures, including data protection by design and by default and security measures, breach notification, data transfers outside the EU, or dispute resolution procedures.

  Building on the examples of the existing ag data codes reviewed, the focus seems to be on *consent, disclosure and transparency* and as seen in chapter 2.1 under "Content", typical aspects expected to be covered by such codes are:
  - Data ownership (which can be asserted or left to the contractual agreements)
  - Farmer's consent for data collection, access and control, right to opt out
  - Transparency, information on collection and reuse purposes
  - Data disclosure limitations, data reuse limitations
  - Data portability
  - Data retention and availability
  - Liability and security safeguards.

- **Terminology**
  Some key terms used in existing codes come from data management and information systems terminology (data provider, data consumer, data access, protocols...), others come from the agri-food value chain environment (input, crop production, advisory services, agribusiness, service providers, farmer-led associations...). The existing codes can also provide some useful new terminology (like "data originator"). It is important to define these terms when writing the code of conduct. Some specific recommendations as regards terminology are:

  - Consider the use of the "data originator" concept. This term is used in the EU code and can be useful to distinguish this role from the more commonly used roles of data provider or data owner, working around the legal difficulties of asserting data

ownership. However, the distinctions should be clearly specified in order not to create confusion.

- In some parts of the existing codes, there seems to be a distinction (even a contraposition) between agribusinesses and farmers' associations, which does not account for: a) the fact that farms are agribusinesses themselves; b) there are farmer-led agribusinesses that have a very similar function to farmers' associations. Since the role of the various actors and the potential coinciding/conflicting interests are very important, a code should present definitions and consistent use of terms like agribusinesses, farmers' organisations, farmers' aggregations, farmer-led associations, etc.

Conclusions

Codes of conduct and industry-led self-regulation in general can be a viable option for filling the normative gap for the sharing of farm data. They can build trust, by being co-developed, adopting a participatory inclusive governance and addressing the concerns of the farmers. They can help set common standards for farm data sharing contracts even across countries and regions. Codes of conduct can change the way agribusinesses think about data and make data producers, primarily farmers, more aware of their rights.

The set of recommendations proposed in this document stresses the importance of:

- adoption, considering a balance between attraction and high standards
- credibility, which depends highly on the level of representation and inclusiveness of stakeholders and the independence of auditing and certification
- the role of stakeholders: farmers are the data originators and their representatives should be key driving forces behind a code of conduct for farm data sharing.

The next step after this review is the creation of working teams for:

- guidelines on how to develop an ag data code of conduct, prepared especially as support material to enable farmer-led organisations to co-develop or negotiate codes of conduct
- a general scalable template of a code of conduct for farm data sharing across the value chain validated by farmers' organisations and technology providers
- pilot cases.

Interested partners can participate in our work on codes of conduct by joining the GODAN Sub-Group on Data Codes of Conduct[8] and/or expressing their interest in the developments of the Collective Action on Empowering Farmers through Equitable Data Sharing[9].

[8] https://www.godan.info/working-groups/sub-group-data-codes-conduct
[9] https://www.gfar.net/documents/vision-and-strategic-plan-collective-action-empowering-farmers-through-equitable-data

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