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Who Owns Farm Data? Towards a Sui Generis Framework for Agricultural Data Governance in India's Digital Agriculture Ecosystem

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With the rising use of AI, IoT technology, drones, satellite mapping, and precision farming tools, farm data in India has emerged as a vital economic asset in the field of digital agriculture. Data generated from farms regarding soil composition, productivity, weather conditions, irrigation techniques, and farmer behaviour is increasingly being collected and monetised by Agritech companies. Despite its growing economic importance, Indian law does not provide a clear framework governing the ownership, control, and commercial exploitation of agricultural data. In this Article, the regulatory possibilities for farm data have been analysed in the light of prevailing intellectual property laws and other related laws in India and the conflicting claims regarding the ownership of farm data raised by farmers, agricultural technology companies, and platforms have been assessed. A doctrinal and comparative analysis approach has been adopted to assess the application of copyright laws, patent laws, protection of trade secrets, and data protection laws on farm data. According to this article, there are unique properties that set apart agricultural data from other types of intellectual property, such as non-rivalrousness, constant production, and reliance on technology in creating value. These properties render the current legal provisions inappropriate in addressing ownership and control issues. Consequently, there is a regulatory void characterised by a lack of clarity, exacerbation of information disparities, and exploitation of farm-generated data. To fill the regulatory vacuum and provide effective management of farm data, the article recommends the creation of a sui generis farm data governance system that identifies farmers as data creators, imposes data fiduciary duties on agritech firms, and follows transparency, informed consent, and

benefit-sharing principles. This type of system is crucial for ensuring that the digital agriculture revolution is not only innovative but socially just as well.

Keywords: *agriculture data, data ownership, intellectual property rights, data governance, sui generis protection.*

INTRODUCTION

Traditionally, agriculture was known to be associated with land, labour, and production capacity. But in the last few years, there have been some fundamental changes in this industry, owing to digital technology. The introduction of technologies like artificial intelligence, Internet of Things (IoT), drones, satellite images, and precision technologies has transformed agriculture into a highly data-driven industry.¹ In this context, making decisions related to agriculture is not dependent only on experiential learning or physical observation but has become a matter of extensive analysis of data sets and predictive models.²

In this regard, agricultural data has assumed great significance. Agricultural data related to the composition of the soil, crop performance, pattern of irrigation, climatic factors, estimated yields, and farming practices are being constantly gathered through digital means. This data is analysed and processed by Agritech firms to offer their advisory services or make the process of input use and production more efficient. Thus, agricultural data has assumed great significance in terms of its economic value as well.

India is one of the most vital jurisdictions within the scope of this transformation, due to the country's predominantly agrarian economy and swift digitalisation of the rural sector.³ Governmental projects on digital agriculture, alongside the emergence of privately owned Agritech platforms, have led to an increased use of data-based technology in the realm of agricultural⁴ activities. Unfortunately, the fast pace of technology development has not been supported by the appropriate development of legislation concerning data property and management.⁵

¹ *The State of Food and Agriculture 2022: Leveraging Automation in Agriculture for Transforming Agrifood Systems* (Food and Agriculture Organisation 2022)

² *Data-Driven Agriculture* (World Bank 2021)

³ NITI Aayog, *Strategy for New India @75* (Government of India 2018)

⁴ *Digital Agriculture Mission* (Ministry of Agriculture and Farmers Welfare 2021)

⁵ *Data governance* (Organisation for Economic Co-operation and Development Publishing 2022)

This is particularly significant for two reasons. Firstly, the main question that remains unanswered concerns the property of data produced by farmers. Although farmers are responsible for creating primary data by using their agricultural tools and interacting with digital systems, it is usually agritech companies and digital platforms that manage and utilise them commercially.

Currently, Indian law does not offer a systematic approach that would help solve the matter at hand. Intellectual property law, which has long been used to protect ownership of intangible objects, is not fully capable of addressing the challenges posed by agricultural data.⁶ In particular, copyright law offers protection for expressions of originality and not the facts themselves;⁷ patent law for inventions and not databases; and trade secret law requires that any such protection be built around contractual and other confidentiality measures.

Such an approach creates serious challenges. The absence of any legal regulations means that Agritech platforms have unfettered freedom to collect vast amounts of agricultural data without providing the farmers with much transparency or opportunities for sharing the benefits from their collection. Such an arrangement gives rise to problems related to fairness, autonomy, and justice within the digital agriculture sector.

Within this context, this present article critically explores the legality of farm data in India and assesses whether the current intellectual property laws provide enough provisions for governing farm data. Moreover, this paper explores the conflicting claims of ownership made by various stakeholders, including farmers, Agritech corporations, and digital platforms, based on experiences gained in other countries around the world. Ultimately, this Article concludes that there is no way of regulating farm data under conventional doctrines of intellectual property laws and hence, a *sui generis* legal regime needs to be developed for farm data.

Therefore, this Article recommends developing a *sui generis* legal regime of farm data governance in India. In particular, a *sui generis* legal regime will take into account the fact that farmers are the main generators of farm data, create fiduciary duties for Agritech

⁶ Copyright Act 1957; Patents Act 1970

⁷ *Feist Publications Inc v Rural Telephone Service Co Inc* [1991] 499 US 340

companies and follow principles such as transparency, informed consent, and benefit sharing.

UNDERSTANDING AGRICULTURAL DATA AND THE DIGITAL AGRICULTURE ECOSYSTEM

Meaning and Legal Character of Agricultural Data: By definition, agricultural data involves all sorts of structured and unstructured data collected throughout the agricultural cycle, from growing to monitoring, harvesting, storing, and distribution.⁸ In the current landscape of digital agriculture, apart from classical agronomic information, there are technological inputs, such as sensors, satellite data, drone outputs, soil analysis, weather, and algorithm predictions involved.⁹ The problem with agricultural data from the point of view of legislation lies like data, which is constantly produced and updated through automated mechanisms used within farming operations.¹⁰ In contrast to other datasets, it cannot be defined as a complete and ready object but as something created in real time, thus making classification within the scope of law impossible.

Classification and Legal Complexity of Agricultural Data: The data that are involved in agriculture in the digital economy fall broadly under three categories, namely environmental data, operational data, and behavioural data. Environmental data include soil quality, rainfall, temperature, and climate. Operational data pertain to agricultural practices such as irrigation schedules, pesticide use, seed choice, and harvest methods. Behavioural data include farmer behaviour and market activity.¹¹

However, the legal complications lie in the fact that the data are not easily categorised as proprietary materials. Though environmental and operational data could seem to be facts and not an original creation, behavioural data might cross the boundaries of commercial

⁸ The State of Food and Agriculture 2022: Leveraging Automation in Agriculture for Transforming Agrifood Systems (n 1) 83-85

⁹ *Digital Opportunities for Better Agricultural Policies* (Organisation for Economic Co-operation and Development Publishing 2019) 15-19

¹⁰ *Innovation with a Purpose: The role of technology innovation in accelerating food systems transformation* (World Economic Forum 2018) 28-30

¹¹ Nikola M Trendov et al., *Digital Technologies in Agriculture and Rural Areas* (Food and Agriculture Organization 2019) 16-19

confidentiality. Hence, it becomes difficult to ascertain whether the agricultural data are considered property, intellectual production, or simply facts beyond proprietary rights.¹²

Agritech Ecosystem and Structural Imbalance: With the advent of agritech platforms, the generation and control of data related to agriculture have undergone radical changes. While farmers continue to be the source of unprocessed agricultural data, agritech companies collect, analyse, and transform this data into something useful using proprietary technologies. This has resulted in an inherent imbalance in the control of the creation of value from the said data. The reason behind such a concern is that, whereas the farmers are the generators of the data, agritech companies have the sole power to collect, analyse, and derive value from the said data. A legal issue that arises out of this scenario is whether data control is one of ownership, licensing, or fiduciary in nature.

Agricultural Data as an Economic and Strategic Asset: In the digital economy, there is a rising acknowledgement that data represents a kind of economic good having substantial value. Data associated with agriculture is especially useful since it makes possible the use of predictive analysis, risk assessment, yield maximisation, and increased efficiency in logistics. Unlike tangible assets, however, data is characterised by its non-rivalrous nature and infinite duplicability; in other words, data can be used by many different individuals without becoming exhausted.¹³ Consequently, data poses a challenge to the principles underlying traditional property law. Agricultural data is thus a sort of hybrid legal entity that operates both as an input, an output, and a commodity that can be traded.¹⁴

Legal Tension and Regulatory Vacuum: Commodification of agricultural data has resulted in the existence of a three-way legal tension involving the farmer, agritech firm, and the state. The farmer claims that there is a natural and moral right to have rights over the data generated during farming. The agritech company makes use of contractual means and control of technology to make claims to exclusive rights over the agricultural data collected. Under the current legal framework in India, there exists no statutory method through which

¹² Pamela Samuelson, 'Privacy as Intellectual Property?' (2000) 52(5) Stanford Law Review 1125, 1136-39 <https://people.ischool.berkeley.edu/~pam/papers/privasip_draft.pdf> accessed 23 May 2026

¹³ *Data-Driven Innovation: Big Data for Growth and Well-Being* (Organisation for Economic Co-operation and Development Publishing 2013) 29-32

¹⁴ Jody M Freeman and David B Spence, 'Old Statutes, New Problems' (2014) 163(1) University of Pennsylvania Law Review 1, 45-48 <<https://pennlawreview.com/2014/12/15/old-statutes-new-problems/>> accessed 23 May 2026

agricultural data can be owned, controlled, and governed.¹⁵ Consequently, this creates a gap in regulation where private firms make rules for data governance within the digital agriculture system by means of contracts and platforms. Such an approach poses significant risks and issues of transparency and justice.

Analytical Transition to Legal Framework: The defining features of agricultural data suggest that it cannot be classified as either ‘property’ or ‘intellectual property.’ The continuous creation, shared utility, and dependency on algorithms render it categorically different from any other assets under existing legal regimes. Given this structural divergence, there arises the question of whether Indian intellectual property laws, contract laws, and data governance laws can regulate agricultural data effectively or if a new sui generis regime is needed.¹⁶

EXISTING LEGAL FRAMEWORK IN INDIA: CAN CURRENT LAWS GOVERN FARM DATA?

The emergence of new agricultural data, along with its commoditization, has led to critical issues regarding who should own and control the data that is generated from the process of farming, as well as the manner in which such information can be exploited economically. Nevertheless, it should be noted that the concept of agricultural data cannot be categorised easily in existing legal doctrines under the laws of India. Thus, due to the lack of an appropriate framework, the possibility of using other legal regimes has had to be explored. This section will contend that while existing laws do provide for some protection to parts of agricultural data, they fall short of providing for a legal regime that would be able to determine the issues of ownership, control, or sharing benefits.

Copyright Law and Agricultural Data: The first major piece of legislation in India on copyright law is the Copyright Act 1957.¹⁷ The copyright subsists in original literary, dramatic, musical and artistic works, cinematograph films and sound recordings. As per section 13 of the Act, protection is only provided to original expression and not to any

¹⁵ Digital Personal Data Protection Act 2023

¹⁶ Graeme B Dinwoodie, ‘A New Copyright Order: Why National Courts Should Create Global Norms’ (2000) 149(2) University of Pennsylvania Law Review 469, 517–19

<https://repository.law.upenn.edu/documents?search=%22https%3A%2F%2Fscholarship.law.upenn.edu%2Fcgi%2Fviewcontent.cgi%3Farticle%3D3295%26context%3Dpenn_law_review%22&searchtypes=Metadata|Full%20text&applyState=true&article=3295&context=penn_law_review> accessed 23 May 2026

¹⁷ Copyright Act 1957, s 13

underlying facts, ideas, information or data.¹⁸ The agricultural data, in its most basic form, will consist mainly of information such as soil composition, weather information, crop production and yield rates, irrigation, and other agricultural practices. Information does not have originality for copyright since the information already exists as discovered truth, which means the agricultural data generated cannot usually be subject to copyright protection.¹⁹ This difference in facts and originality has been established by many judgments in both Indian and foreign jurisdictions. In the case of *Eastern Book Company v D B Modak*, it was held by the Supreme Court of India that copyright protection must include minimum creative labour and effort, and cannot be extended to mere mechanical compilation of facts.²⁰

Similarly, in *Feist Publications Inc v Rural Telephone Service Co Inc*, it was established that facts cannot have copyright protection since they existed independently.²¹ Whereas raw agricultural data itself may not be copyrighted, databases and compilations produced by agritech companies are likely to fall under the scope of copyright law if the requisite standard of originality based on selection, coordination, or arrangement of the data is met.²² Hence, proprietary dashboards, analytical reports, prediction models, and visualisation of data produced by agritech platforms are also likely to qualify for protection under copyright as original works of authorship or databases. Copyright protection for compilations does not confer any ownership right to the original data itself. Copyright exists only in respect of the original selection, coordination, or arrangement of information and not in the underlying agricultural data. Therefore, copyright protection will not resolve the key issue of ownership of farm-derived data.

Patent Law and Agricultural Data: Under the Patents Act 1970, patents protect any invention that meets the criteria of being novel, inventive, and industrially applicable.²³ The Act protects inventions and processes, which are technological innovations and not information or datasets. Data from agricultural operations is inherently factual information acquired through the process of farming, and thus does not fall within the scope of invention as defined by patent law. Information on soil, climate, and crop yield data cannot meet the legal

¹⁸ *Ibid* ss 13 and 13(1); *Eastern Book Company and Ors v D B Modak and Anr* (2008) 1 SCC 1 [33]-[36]

¹⁹ *Feist Publications Inc v Rural Telephone Service Co Inc* [1991] 499 US 340

²⁰ *Eastern Book Company and Ors v D B Modak and Anr* (2008) 1 SCC 1 [33]-[45]

²¹ *Feist Publications Inc v Rural Telephone Service Co Inc* [1991] 499 US 340

²² *Eastern Book Company and Ors v D B Modak and Anr* (2008) 1 SCC 1 [42]-[45]

²³ Patents Act 1970, ss 2(1)(j) and 2(1)(ja)

criteria for patent protection since they are neither novel inventions nor innovative in any manner. The technology used in digital agriculture operations, like algorithms, machine learning, sensors, and data processing techniques, may be subject to patent protection if it meets the necessary criteria of patentability.²⁴ It is imperative to note, however, that the patent only covers the innovation aspect, not the agricultural data analysed through the technology. This is important because although the technology is owned by an organisation, it does not imply ownership of the data acquired through the application of the technology. The ownership of data obtained through the use of the technology cannot be implied in the same manner as the ownership of the technology itself. In this respect, patent law protects innovation related to the processing of farm data but does not define the ownership and exploitation of data.

Trade Secret Protection and Contractual Governance: Where there is no statutory protection for ownership of farm data, agritech companies depend on trade secrets and contractual provisions to gain control over agricultural data. There are no laws related to trade secrets in India.²⁵ The protection can be achieved by means of contract, confidentiality agreements, and doctrines recognised by courts. Agritech firms ensure that their database, algorithms, predictive models, and client data are protected via licenses and confidentiality clauses in terms of service.

As a result, contract law became the predominant tool for managing agricultural data. Farmers tend to agree to large-scale data harvesting and processing through contractual provisions provided by agritech platforms. At the same time, such contractual relations typically demonstrate an imbalance in bargaining power and a lack of transparency. Use of contract law leads to numerous legal problems. Firstly, consent provided in long and complicated contractual documents might not be regarded as informed consent.²⁶ Secondly, the use of standard form contracts allows agritech companies to exert considerable influence over the data while remaining opaque about commercial usage. Finally, farmers usually lack

²⁴ *WIPO Technology Trends 2021* (World Intellectual Property Organization 2021) 23-30

²⁵ *John Richard Brady and Ors v Chemical Process Equipments Pvt Ltd* AIR 1987 Del 372; Sharon K Sandeen and Elizabeth A Rowe, *Trade Secret Law in a Nutshell* (West Academic Press 2017) 8-10

²⁶ Margaret Jane Radin, *Boilerplate: The Fine Print, Vanishing Rights, and the Rule of Law* (Princeton University Press 2012)

bargaining power for negotiation over data-related conditions. Use of contract law enables private organisations to regulate agricultural data according to their own rules.

Digital Personal Data Protection Act, 2023 and Agricultural Data: The passing of the Digital Personal Data Protection Act, 2023 is a critical event in the evolution of the data governance structure in India.²⁷ The Act is a legal document that addresses the regulation of digital personal data processing activities. Nevertheless, it would be unreasonable to assume that the Act has the potential to be applied to regulate agricultural data processing. Much of this data includes non-personal information about the properties of soil, climate conditions, crop yields, and farming practices.²⁸ Generally speaking, these factors do not relate to personal data protection laws. Certain categories of data pertaining to agriculture may qualify as personal data if they are related to the identification of a particular farmer. Financial data, geographical information, data on transactions made by the farmer, and personally identifiable farming practices can fall into this category. The problem is that the Act does not regulate farmers' rights with respect to the use of non-personal data for their benefit. The Digital Personal Data Protection Act, 2023 can be viewed as providing additional security only for specific kinds of farmer-related data. It cannot be used as a comprehensive regulatory measure.

Fragmented Protection and the Regulatory Vacuum: An analysis of the extant legal system shows that Indian laws view the data generated from farms in isolation from other legal principles. Copyright laws offer protection for original expression or compilation, but not for facts per se. The patent laws protect inventions and technologies, but not the dataset. Trade secrets are protected on the principle of confidentiality and contract. The data protection laws cover only personal data and exclude a considerable amount of data generated from farms.

None of the legal doctrines above can alone or in combination satisfactorily address the following questions:

1. Who are the farm data?
2. Who can make commercial use of the data?
3. Do farmers have any rights over access, portability, consent, or benefit sharing?

²⁷ Digital Personal Data Protection Act 2023

²⁸ Committee of Experts on Non-Personal Data Governance Framework, *Report* (Ministry of Electronics and Information Technology 2020) 23-28

4. Do agritech platforms have any fiduciary responsibilities to farmers who generate data?

All the gaps together result in a regulatory void. As a result, the ownership and control of farm data are governed entirely by private contracts and technological powers of agritech platforms.

COMPETING OWNERSHIP CLAIMS OVER FARM DATA: FARMERS, AGRITECH COMPANIES, AND THE STATE

Due to the lack of specific legislation regulating agricultural data, there have been many uncertainties concerning the issues of ownership and control of farm-generated data. As opposed to traditional types of property, agricultural data is perpetual, able to be used by multiple entities at once, and gains its value mostly through its aggregation and analysis. Thus, several stakeholders make claims over agricultural data depending on their legal, economic, and moral grounds. First of all, the main parties involved in this matter are farmers themselves, agritech firms, and the state. Farmers base their ownership claims on the fact that farm data is generated from the property owned by them: their land and labour. Agritech firms make their claims over their agricultural data based on technological effort, legal agreements, and analysis. At the same time, the state shows interest in this matter due to its impact on national food security and other aspects of agriculture and digital governance. The section aims to analyse these claims critically and demonstrate that none of them is enough to solve the legal problems of agricultural data.

Farmers as Primary Data Generators: Agricultural data has a strong claim on its own because it is the farmers who produce it. Data relating to the state of the soil, crop state, watering, agricultural practices, and productivity is collected due to the involvement of the farmer in agriculture and land use. In other words, no agricultural data can exist without the work of the farmer. From the viewpoint of the theory of distributive justice, it seems unfair for organizations which only collect and process information to have control over information produced by others.²⁹ Data about agricultural practices, economic situation, and strategy of operations might be extremely sensitive. In other words, denying the right to manage such data to farmers could be seen as unjust. Finally, from the viewpoint of

²⁹ John Rawls, *A Theory of Justice* (Harvard University Press 1999) 52-57

informational self-determination and equity, the ownership of data should be attributed to farmers. The reason for that is that individuals have a right to be informed and manage data produced due to their actions.³⁰ Nevertheless, giving legal recognition to such ownership rights in favour of farmers poses both practical and philosophical challenges. Agricultural data is created using technology that belongs to agritech firms, and it becomes useful only after considerable effort has been put into its processing and analysis. In addition, agricultural data exhibits properties of collective action insofar as the information collected from several farms needs to be collated for prediction purposes. It follows that while farmers have a morally and equitably strong claim to their farm-generated data, recognising property rights over them might not be practically or economically feasible.

Agritech Companies and Claims Based on Technological Investment: Ownership claims by agritech companies are made through their involvement in technology creation and significant financial input. The gathering, storing, processing, and analysing of agricultural data involves considerable expenses for IT infrastructure, software programming, cloud computing services, sensory devices, and AI technologies. As such, agritech organisations argue that their investments in research and development have provided them with the right to make claims concerning data ownership. In this regard, it should be noted that raw data is economically worthless until it undergoes a series of organisational processes, which include sorting, analysis, and transformation into useful information through the use of proprietary algorithms and methods. Also, agritech companies tend to use contractual relations with farmers to claim rights to the data collected using digital tools. Through licensing agreements and service contracts, the companies receive permission to collect, store, and extensively use agricultural data. However, granting property rights in this situation may result in severe issues, as it is known that the standard contract format implies inequality of interests and insufficient transparency of data processing and exploitation procedures. Additionally, allowing ownership exclusively with agritech companies would create information monopolies in the agricultural industry, which is dangerous for several reasons, because the owners could use their data control capacity to exercise market power to control production and pricing processes. Hence, even though these agritech companies have justifiable claims in the form of capital input and added value, this justification cannot

³⁰ Alan F Westin, *Privacy and Freedom* (Atheneum 1967) 7

be used to exclude farmers completely from the advantages of the agricultural information generated.

State Interests and Public Governance of Agricultural Data: The state has legitimate interests in agricultural data because of the crucial importance of such data for policy-making and national development. Agricultural data are essential in the context of developing strategies related to food security, climate change adaptation, disaster response measures, crop prediction, subsidy distribution, and resource allocation. Governments nowadays are more and more reliant on agricultural data to make informed decisions and to initiate digital government projects. Accessible and reliable agricultural data have the potential to positively influence both policymaking and agriculture-related achievements. Nevertheless, the state's possession of agricultural data entails certain concerns in relation to privacy violations, surveillance practices, and overcentralization of information. The centralised power that the state has over agricultural data might undermine the autonomy of farmers and bring about certain risks connected to mismanagement, improper security measures, or inappropriate intervention in agricultural decisions. Besides, focusing only on the public aspect of agricultural data disregards the interests of farmers who generate agricultural data together with other parties involved. In this sense, exclusive ownership of such data by the state is not appropriate. Thus, one may conclude that the primary role of the state is more regulatory in nature rather than proprietary.

Why Conventional Ownership Models Fail: The conflicting claims raised by farmers, agritech firms, and the government expose the inherent constraints of the conventional property regimes. The agricultural data lacks the typical attributes associated with private property. Firstly, agricultural data is non-rival; different parties can make use of identical data concurrently without devaluing the data at all. Secondly, agricultural data is constantly being created and co-created by various parties such as farmers, agritech firms, and digital networks. Lastly, agricultural data often gains value only by virtue of aggregation and analysis.³¹ These attributes pose challenges for adopting the traditional notion of property based on exclusivity, possession, and control. An effort to impose exclusive ownership may fail to recognise the participative nature of data creation in agriculture. Therefore, it is

³¹ Viktor Mayer Schönberger and Kenneth Cukier, *Big Data: A Revolution That Will Transform How We Live, Work and Think* (John Murray 2013) 96-103

imperative to avoid thinking about agricultural data along the lines of property and instead think about governance that entails collective ownership.

Towards a Rights-Based and Shared Governance Approach: The competing ownership claims show that not one stakeholder can make a complete claim to the agricultural data. The farmers supply the base information through agricultural processes, while the agritech companies derive profit through innovations in technology and analytics, and the state has its regulatory role associated with public interest considerations and food security. It is therefore important to establish a governance system that will transcend ownership principles and embrace a rights-based approach to agricultural data management.³²

The approach requires that:

1. Farmers should be regarded as generators of data who have rights related to informed consent, access, transparency, portability, and benefits.³³
2. Agritech companies should be allowed to use and analyse data subject to fiduciary responsibility and contractual fairness.

The state should serve as a regulator that ensures competition and protects public interests. Such an approach will acknowledge the complex nature of agricultural data and ensure all stakeholders have their rightful interests without having an exclusive claim over the agricultural data.

COMPARATIVE INTERNATIONAL APPROACHES TO AGRICULTURAL DATA GOVERNANCE AND LESSONS FOR INDIA

The lack of clarity regarding farm data in Indian law does not make it any more difficult than in other places. Agricultural data has been widely acknowledged as economically valuable in many jurisdictions due to its capacity to affect production, trade, and technological advancement. Countries have had to formulate governance mechanisms in response to the fast digitalisation of agriculture to resolve data ownership, consent, transparency, and commercialisation problems. No jurisdiction can claim to have developed a universally accepted farm data ownership approach. On the other hand, each jurisdiction has adopted a

³² European Commission, 'A European strategy for data' (19 February 2020) COM (2020) 66 final

³³ *Australian Farm Data Code* (National Farmers' Federation 2020) Principles 1-8

distinctive form of regulation based on its legal system, technological capability, and policy preferences. Comparing the different forms of regulation can provide insights into how best to develop an appropriate governance mechanism for India. In this regard, it will be necessary to study the approaches of the United States, the European Union, and Australia, among others.

United States: Industry-Led Governance and Contractual Protection: The US has become one of the top jurisdictions in the area of digital agriculture, where high levels of use of precise farming technologies and innovations provided by the private sector have been noted. However, despite the importance of agricultural data from an economic standpoint, no comprehensive legislation has been passed in the country regulating the question of data ownership. The approach used in the United States in terms of regulation in digital agriculture is mainly industry-focused, relying mostly on voluntary governance principles and contracts. As early as 2014, the major agricultural organisations and companies initiated the development of Privacy and Security Principles for Farm Data, aimed at setting certain standards with respect to issues such as transparency, consent, data portability, and disclosure of business practices.³⁴ These principles state that farmers shall control the usage and distribution of agricultural data collected during their work.³⁵ Furthermore, it is emphasised that informed consent is to be received before any data collection and usage activities. Another initiative similar to that one is the creation of the Agricultural Data Coalition (ADC). Its goal is to promote safe data exchange as well as farmers' autonomy concerning their data.³⁶ However, despite these innovations, the United States model is not without some weaknesses. Being voluntary, enforcement will obviously be limited to contractual requirements. The agritech firms still have substantial control through their contractual practices, and legal recognition of ownership rights over agricultural data is still absent. As such, the case of the United States shows how voluntary regulation can promote transparency and raise awareness of issues, but cannot solve problems related to the power imbalance.

European Union: Rights-Based Data Governance and Regulatory Oversight: However, the European Union has employed a relatively rights-based model when it comes to the issue of

³⁴ *Privacy and Security Principles for Farm Data* (American Farm Bureau Federation 2014) Principles 1-10

³⁵ *Ibid* Principle 2

³⁶ 'About Us' (Agricultural Data Coalition) <<https://agdatacoalition.org/about-us>> accessed 23 May 2026

data governance. Even though there is no legislation passed in the European Union specifically regarding the matter of agricultural data ownership, a comprehensive set of regulations aimed at ensuring transparency and data sharing has been developed.

The EU model of governance is based on the assumption that individuals and businesses should control the data created by their actions. The General Data Protection Regulation prescribes the necessary standards for ensuring the right to consent, transparency, accountability, and the right to access personal data.³⁷ Although the vast majority of agricultural data falls into the category of non-personal, the key ideas implemented within the GDPR heavily affect the debate on governance of non-personal data. Two other pieces of legislation adopted by the European Union are the Data Governance Act and the Data Act. These documents aim to ensure easy access to data generated via connected products and digital services, as well as sharing the latter among stakeholders. The adoption of these acts is linked to the recognition of the economic value of data and the need to prevent monopolisation. Obligations, access equality, and avoidance of data aggregation. Instead of granting individual ownership rights, Europe's approach is to develop a framework wherein there are shared rights and obligations for all parties involved. Still, there are several challenges to this policy. It is quite hard to define whether the agricultural data being discussed is personal data or not, as well as the issue of ownership rights in such cases. Yet, despite these difficulties, the approach taken by Europe shows the role of regulation and accountability in data governance.

Australia: Farmer-Centric Governance and Ethical Data Principles: Australia, on the other hand, has embraced an extremely farmer-friendly approach towards the regulation of agricultural data governance. In view of the ever-growing importance of agricultural information, Australia created the Farm Data Code, a set of principles intended to foster fairness, transparency, and accountability in relation to agricultural data.

This Code is based on several essential principles, such as:

- Transparency of the process of collecting and using farm data
- Disclosure of data sharing practices
- Taking into account farmers' interests when dealing with agricultural information

³⁷ General Data Protection Regulation 2016, arts 5, 6, 12-15

- Availability and portability of agricultural data
- Prevention of unauthorised use and disclosure of information.

This principle requires agritech companies to disclose detailed information concerning the process of collecting, storing, using, and monetising farm data. Moreover, it calls for simplifying contract conditions and improving accountability in the field. The significance of the Australian approach lies in the fact that it goes beyond proprietary models in favour of governance principles that ensure the protection of farmers' interests but not complete restrictions on innovations. Still, Australia's approach to agricultural data governance is voluntary, which means that enforcement problems remain the same. The US experience reveals several valuable lessons for developing countries.

Comparative Analysis of International Approaches: A comparative analysis of the jurisdictions highlights some crucial developments. First, in none of the jurisdictions listed above are their provisions for absolute rights in agricultural data. Instead, they consider the cooperative and relational aspects of data creation and emphasise the importance of governance structures that reconcile competing interests.

Secondly, all three jurisdictions increasingly highlight the role of transparency and consent. In particular, farmers are viewed as key stakeholders who ought to have control over the process of collecting and using agricultural data.

Thirdly, an increasing number of jurisdictions are concerned about information and economic monopolies of technological infrastructure holders. The new framework thus attempts to ensure data portability and equal access, among other things.

Lastly, it can be concluded from international practice that mere contractual solutions cannot resolve issues related to power dynamics and ambiguous ownership of data.

Lessons for India: There are various lessons that India could learn from comparing its experience with that of the United States, the European Union, and Australia.

The first lesson is that India needs to refrain from implementing an absolute ownership regime concerning data because agricultural data is always relational and shared. The second lesson is that Indian farmers should be considered the main data producers and should have certain rights associated with informed consent, transparency, access, and benefit sharing.

The third lesson is that agritech companies need to be held accountable for collecting, processing, and using agricultural data. The fourth lesson is that India should ensure data portability and interoperability to foster competition in the digital agriculture industry and prevent monopolisation.

Lastly, India needs to abandon its current voluntaristic governance regime concerning agricultural data and introduce a statutory approach that will enable enforcing rights and obligations with respect to this data. Thus, it seems clear that governance of agricultural data cannot be established by applying general intellectual property regimes because this data deserves special treatment.

CHALLENGES AND LEGAL GAPS IN INDIA'S FARM DATA GOVERNANCE FRAMEWORK

The digital revolution in agriculture has created numerous possibilities for increasing agricultural productivity, improving resource utilisation, and fostering decisions based on facts. Nevertheless, the rise of data-based technology has also revealed certain regulatory gaps within the current legal framework for agricultural governance in India. While agricultural data has been recognised as an important economic asset, there is no well-established legal system that would regulate its ownership, collection, and utilisation. The lack of a corresponding regulatory mechanism has created certain ambiguities concerning the rights and duties of different actors, thereby increasing the risks of unfair exploitation, information asymmetries, and unequal distribution of gains from this practice. This paper discusses in detail the major challenges related to the regulation of agricultural data in India.

Absence of a Clear Ownership Framework: First and foremost, the issue here arises out of the fact that no legislation in India determines the ownership of agricultural data.³⁸ Neither Indian statutes nor any other existing intellectual property legislation recognises farm-generated data as property owned by someone, nor do they define the individual entitled to the ownership of this data. According to the arguments presented in previous parts of the paper, IP legislation does not allow the owners of agricultural data to claim any property interests in their raw data, and the provisions on data protection relate solely to personal data. In other words, there are no laws regulating the problem of ownership in agricultural

³⁸ Digital Personal Data Protection Act 2023

data. At the same time, the problem of legal uncertainty has practical consequences for the development of the digital agriculture industry. Namely, due to the absence of ownership laws, agritech firms can control agricultural data via technological means and contracts. On the other hand, farmers have no certainty about who owns the data they generate.

Information Asymmetry and Unequal Bargaining Power: A significant challenge in the governance of agricultural data arises from the asymmetrical relationship between farmers and agritech companies. Most farmers possess limited technical knowledge concerning data collection mechanisms, analytical processes, and commercial uses of agricultural information. Agritech companies, on the other hand, possess superior technological capabilities and substantial informational advantages. They determine the methods of data collection, storage, processing, and monetisation while simultaneously drafting contractual arrangements that govern data usage. This imbalance frequently results in unequal bargaining power. Farmers often consent to broad and complex contractual terms without fully understanding the implications of data sharing. Standard-form agreements generally provide little opportunity for negotiation and frequently fail to disclose the extent to which agricultural data may be commercially exploited. Such information asymmetry raises serious concerns regarding meaningful consent, procedural fairness, and exploitation of vulnerable stakeholders. In the absence of legal safeguards, consent obtained through unequal contractual relationships may fail to adequately protect farmers' interests.

Data Monopolisation and Concentration of Market Power: The rising trend towards greater consolidation of agricultural data by a small number of agritech platforms constitutes another major issue. The value of agricultural data usually goes up with its scale and integration. Thus, parties with the ability to utilise big data are likely to gain competitive advantages when creating forecasting models, artificial intelligence systems, and market intelligence. Agricultural data consolidation has the potential to lead to the formation of data monopolies that would wield a great deal of leverage with respect to agricultural resources, logistics chains, and market opportunities. This might lead to an erosion of competition, greater dependence on digital gatekeepers, and reduced negotiating power of farmers.

Moreover, the consolidation of agricultural data could give private entities control over access to information, which plays an increasingly important role in modern agriculture. This could contribute to economic disparity and present obstacles to entry into the market for

agritech companies and other newcomers. Consequently, the lack of regulatory tools to counteract the issue is a serious threat to competitive equality in the digital agriculture industry.

Absence of Benefit-Sharing Mechanisms: One of the most important limitations of the existing structure is the lack of provisions guaranteeing that the resulting benefits are distributed equally.³⁹ Data produced through farmers' activities can often lead to the development of commercial products and services, for example, predictive models, precision farming equipment, market intelligence tools, and artificial intelligence technologies. Despite being the creators of much of this data, farmers do not always enjoy any economic gains due to its monetisation. This problem creates serious ethical issues related to questions of distributive justice. If companies are allowed to enjoy commercial advantages gained through the use of data collected on farms while ignoring farmers' contributions, then it is likely that some unfair practices will be created in the sphere of digital agriculture.

Lack of Institutional and Regulatory Oversight: India currently does not have any specialised institutional body that regulates the governance of agricultural data. Different facets of digital agriculture are governed by various government departments and agencies, thus leading to a lack of coherence in the governance of such data. The non-existence of any specific regulator creates various problems. Firstly, there is no institutional body that formulates standards for issues like transparency, consent, interoperability, and accountability. Secondly, there is no dispute resolution system in place to settle disputes related to agricultural data. Finally, there is no centralised oversight in place to facilitate the creation of cohesive policies for data governance. Without any institutional oversight, the process of regulating agricultural data becomes a matter of contractual agreements and platforms, which increases the chances of exploitation.

REIMAGINING FARM DATA GOVERNANCE: THE CASE FOR A SUI GENERIS FRAMEWORK

The aforementioned analysis reveals that current laws in India are not sufficient for the effective regulation of agricultural data. The law on intellectual property rights protects a narrow range of aspects of the use of data-related goods. Data protection law concerns mostly

³⁹ Amartya Sen, *Development As Freedom* (Alfred a Knopf Inc 1999) 73-75

personal data, whereas contracts exacerbate disparities between agritech firms and farmers. Thus, the current system is characterised by a high level of fragmentation and legal uncertainty.

On the other hand, agricultural data represents a unique economic asset whose impact can be traced in agriculture and agricultural production, including issues of productivity, accessibility to markets, technological innovations, and food security. Its main features, including continuous generation of agricultural data, non-rivalry, collective value addition, and dependence on technologies, distinguish it from other types of property and intellectual property. Therefore, it is clear that the need for a special legal system to address the issue of governance of agricultural data arises, which should take into account specific features of such data. Such a regulatory framework must neither give exclusive rights to one of the stakeholders involved nor allow the commercialisation of data through the dominance of agritech companies.

Why a Sui Generis Framework is Necessary: The Sui Generis Approach Is Justified Because of the Limitations Associated with the Existing Legal Theories. To begin with, the agricultural data is mainly factual data that does not qualify for protection by conventional copyright law. Second, it is clear that such data does not meet the threshold required for the invention to be protected through patents. Third, there are concerns regarding the existence of information asymmetry whenever there is a contract. Fourth, the law on data protection does not address the issue of non-personal agricultural data.

Further, the agricultural data lacks several attributes associated with property law principles. First, it is produced consistently. Second, it can be used at once by many different people. Third, its main source of value is derived through its analysis rather than being exclusively owned by a single person. It is therefore necessary to have a special legal framework that takes into account the various dimensions of agricultural data.

Recognition of Farmers as Primary Data Generators: Any effective data governance system needs to consider that farmers are the main source of agricultural data. The information related to soil conditions, crop health, irrigation and agricultural practices is generated by the engagement of the farmers with the agricultural resources. Recognition as primary

producers of data does not necessarily mean that the farmer owns the data. It only recognises the fundamental role played by the farmers and justifies the provision of some legal rights.

Under a sui generis approach, farmers ought to enjoy the following:

Right to Information: Farmers should know what kind of information is collected from the farms, how it is collected, how it is processed, and who processes the information.

Right of Access: The farmers have the right to access the information from the farms, and also be provided copies of such information.

Right to Portability: They should be free to port data across different information systems.

Right to Withdraw Consent: They should be allowed to withdraw their consent to the processing and utilisation of their information.

Right to Benefit-sharing: They have a right to benefit from the commercialisation of the agricultural information generated from the farms.

Principles of Informed Consent and Transparency: The current system of contractual protection of information in agriculture often does not guarantee genuine consent. The standard contracts that govern agricultural information can be lengthy, complex and hard for farmers to understand.

This is why the proposed sui generis approach must include effective consent mechanisms. Such consent must be:

- free and voluntary
- specific and informed
- clearly communicated
- revocable anytime in respect of future operations on data.

Moreover, agritech organisations should provide easy-to-understand notifications about:

- data categories involved
- processing purposes
- sharing data with third parties

- storage time
- commercial use of information.

The issue of consent and transparency is crucial for informational self-determination and fair governance in agriculture.

Equitable Benefit Sharing Mechanisms: One of the principal deficiencies of the existing framework is that farmers often receive little economic benefit from the commercial exploitation of data generated through their activities. A sui generis regime should therefore incorporate benefit-sharing mechanisms based upon principles of distributive justice. Possible mechanisms include:

Revenue Sharing Arrangements: A portion of profits derived from monetisation of agricultural data could be shared with participating farmers.

Data Cooperatives: Farmers may collectively negotiate terms of data sharing and commercial use through cooperative structures.⁴⁰

Preferential Access to Services: Participating farmers may receive subsidised technological services, analytical reports, or agricultural advisories.

Community Development Funds: A percentage of revenue generated through agricultural data commercialisation could be directed towards rural development and digital capacity-building initiatives. Benefit-sharing mechanisms would recognise farmers' contributions while encouraging participation in digital agriculture initiatives.

Establishment of an Independent Farm Data Regulatory Authority: Effective governance requires institutional oversight and specialised regulatory mechanisms. India should establish an independent Farm Data Governance Authority (FDGA), responsible for:

- Framing standards concerning the collection and processing of agricultural data;
- Monitoring compliance with transparency and consent requirements;
- Issuing codes of conduct for agritech entities;
- Adjudicating disputes concerning access, misuse, and benefit-sharing;

⁴⁰ *Agricultural Cooperatives: Key to Feeding the World* (Food and Agriculture Organization 2012) 8-11

- Promoting interoperability and fair competition;
- Conducting awareness and digital literacy programmes for farmers.

A specialised regulator would facilitate consistent implementation of governance principles and ensure accountability among stakeholders.

Proposed Model for India: A Rights-Based and Shared Governance Framework: The analysis undertaken in this article suggests that agricultural data should not be governed through absolute proprietary rights. Instead, India should adopt a rights-based and shared governance model characterised by the following principles:

Stakeholder	Rights and Obligations
Farmers	Access, consent, portability, transparency, and benefit-sharing rights
Agri-tech Companies	Data fiduciary duties, accountability obligations, and fair processing requirements ⁴¹
State	Regulatory oversight, competition enforcement, and public interest protection

The approach acknowledges the collaborative process through which agricultural data is generated and aims for a balance between innovation and fairness. Instead of the question “Who owns farm data?” the pertinent inquiry would be “How can the distribution of rights and obligations around farm data be best structured?” The solution does not rest with ownership but in an approach to governance based on participation, responsibility, and shared benefits.

CONCLUSION

Digital Agriculture has moved agriculture from labour-intensive practices to one where there is an abundance of data available in agriculture. Technologies like artificial intelligence,

⁴¹ Digital Personal Data Protection Act 2023, ss 2(i) and 8

Internet of Things (IoT), drones, satellite imaging, and precision agriculture have led to an abundance of data being created about soils, crops, water usage, climatic conditions, and farmer behaviour. This has led to a debate regarding the issue of ownership, control, access, and benefit-sharing associated with agricultural data, which has immense commercial value now. Unlike the traditional models of intellectual property, which are limited in scope, agricultural data is continuous, simultaneous, and its main value lies in being aggregated and analysed.⁴² Existing legislation in India fails to provide comprehensive legal protection.

For instance, copyright deals with creative works or expressions, while patents⁴³ are for inventions and not for the data itself. Similarly, trade secret law operates within the context of contractual agreements. Finally, the Digital Personal Data Protection Act, 2023, covers only personal data.⁴⁴ From this study, we can conclude that farmers, agritech companies, and the State each have legitimate claims over agricultural data. Farmers produce data from their farming operations, agritech companies help produce such data by investing in technology and analysis capacity, and the State has important interests in ensuring food security and policy-making. But none of these stakeholders can claim proprietary rights since agricultural data are inherently relational and collective. The comparative analysis between various governance frameworks in the US, EU, and Australia shows an increasing trend towards transparency, consent, portability, accountability, and access rather than exclusive rights. The Indian regulatory regime, which is characterised by informational inequality, imbalance in bargaining capacity, risk of data monopoly, lack of adequate benefit-sharing arrangements, and fragmented regulation, places farmers at a great disadvantage. Thus, it is argued in this paper that a sui generis framework for agricultural data is needed. Such a framework would acknowledge farmers' role as main actors producing data and give them a set of rights, including consent, access, transparency, portability, and benefit-sharing. Agritech companies must be placed under a strict fiduciary duty, and the State should act independently.

⁴² European Commission, 'Building a European Data Economy' (10 January 2017) COM (2017) 9 final

⁴³ Copyright Act 1957, ss 13 and 14; Patents Act 1970, s 2(1)(j)

⁴⁴ TRIPS: Agreement on Trade-Related Aspects of Intellectual Property Rights 1995, art 39