

# Farmer Empowerment in The Digital Age: Cyber Law as a Strategic Instrument for Agricultural Development

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**Abstract.** The impact of cyber law regulations on farmers in Indonesia's digital age, focusing on personal data security, cybersecurity, and intellectual property rights. It analyzes the current legal framework using a juridical-normative approach, highlighting the need for regulatory improvements. While cyber law regulations offer a foundation for protection, challenges remain, particularly concerning data security and intellectual property. Limited access to cyber law education underscores the need for inclusive programs. The study emphasizes the importance of empowering farmers to understand their role in the digital ecosystem. Collaboration among government, NGOs, and the private sector is crucial for effective legal support. The article concludes with recommendations for regulatory enhancements and stakeholder engagement. Overall, it provides valuable insights into the complexities faced by farmers in Indonesia's digital transformation, aiming to strengthen legal protection and empower farmers in the evolving digital landscape.

**Keywords:** Cyber Law, Agriculture, Digital Era.

## 1 Introduction

The rapid digital transformation in recent years has significantly changed the agricultural landscape in Indonesia. Farmers, previously accustomed to conventional practices, are now engaged in a new dynamic inspired by information technology and electronic transactions.[1] These changes open the door to higher efficiency, global market access, and farmer empowerment in the digital age.[2] However, along with these positive potentials, various legal challenges require serious attention, especially in the context of personal data protection, cybersecurity, and intellectual property rights.[3] The main regulation governing this area in Indonesia is Law Number 11 Year 2008 on Electronic Information and Transactions (ITE). In an effort to accommodate technological developments and strengthen protections, this law underwent significant changes through Law Number 19 Year 2016. The changes involve key aspects such as cybersecurity, intellectual property rights, and electronic transaction regulation. Furthermore, Government Regulation 71/2019 on Personal Data Protection provides a more specialized framework for protecting personal information, which is increasingly coming into focus in this digital era.[4] Personal data protection becomes even

more important considering that farmers are not only the main actors in the food supply chain, but also the owners of valuable data that needs to be kept secure.[5]

In this context, this article aims to delve deeper into the complexity of cyber law regulations that include the ITE Law and its amendments, as well as personal data protection regulations. The main focus will be on the protection of farmers' personal data, cybersecurity, and intellectual property rights, with the aim of understanding the extent to which these regulations reflect the needs and challenges faced by Indonesian farmers in the era of digital agriculture.[6] Thus, this introduction provides an overview of the context and urgency of this article, as well as providing a foundation for exploring more deeply how cyber law regulations can provide effective protection and in line with the needs of farmers amid the agricultural digital revolution.

## **2 Method**

This research uses a normative juridical approach which is an approach used in legal science research to analyze and understand the law based on applicable legal norms or rules.[7] A normative juridical approach to analyze cyber law regulations relating to the protection of farmers' personal data in Indonesia. This approach involves a review of statutory documents, including Law Number 11 of 2008 on Electronic Information and Transactions (ITE), Law Number 19 of 2016 on Amendments to the ITE Law, as well as Government Regulation Number 71 of 2019 on Personal Data Protection. The steps of this research method include:

1. Identification of Relevant Regulations: Identify the ITE Law and its amendments, as well as the Government Regulation on Personal Data Protection as the main regulations governing the realm of cyber law.
2. Content Analysis of Legal Documents: Conduct an in-depth analysis of the content of legal documents that include articles related to personal data protection, cybersecurity, and intellectual property rights of farmers.
3. Review of Legal Amendments and Changes: Analyze the changes contained in Law No. 19/2016, which is an amendment to the ITE Law, to understand the evolution of the law in data protection and cybersecurity.
4. Comparison with Personal Data Protection Regulations: Investigate the provisions in Government Regulation No. 71/2019 on Personal Data Protection to understand how the regulation integrates the protection of farmers' personal data.
5. Evaluation of Conformity with International Standards: Assess the conformity of Indonesian regulations, particularly the ITE Law and its amendments, with international standards related to personal data protection and cybersecurity.
6. Critical Analysis and Recommendations: Conduct a critical analysis of the adequacy and effectiveness of existing regulations and formulate recommendations for needed improvements or enhancements.

Through this normative juridical approach, this research aims to provide a deeper understanding of the legal framework of cyber law involving the protection of farmers' personal data in Indonesia, as well as to contribute to the improvement of regulations that can enhance the protection and empowerment of farmers.

## **3 Results and Discussion**

### **3.1 Farmer Empowerment in The Digital Age**

**Personal Data Protection and Cybersecurity:** While cyber law regulations provide a basis for protection, it was found that farmers' personal data is still vulnerable to cybersecurity risks.[8] Better implementation of regulations and improved understanding of farmers in relation to cybersecurity practices are imperative. Personal data protection is central to the development of a country's cybersecurity and data sovereignty capabilities. The development of technology puts data into a very valuable commodity. In the aspect of political economy, a country's data sovereignty is faced with the position of the state and the private sector in a global context.[3] **Farmers' Intellectual Property Rights:** Findings indicate a lack of clarity in regulations related to farmers' intellectual property rights, highlighting the need for clearer definitions and stronger protections. Recommendations are given for improvements in regulations, including economic incentives to encourage agricultural innovation. Intellectual Property Rights (IPR) have importance for farmers, especially in the context of protection of farmers' creative works and utilization of IPR to improve the economy.

**Cyber Legal Education and Empowerment:** Cyber legal education for farmers is limited, creating an urgent need for more inclusive and affordable education programs. Improving farmers' legal literacy is crucial to understanding their rights and responsibilities in the digital environment. Cyber Legal Education is important given the rapid development of information technology which is often misused to commit criminal acts.[9] **Roles of Government, NGOs, and the Private Sector:** It was found that stronger synergies between the government, NGOs and the private sector are needed to provide effective support and legal assistance services. Recommendations were given to improve inter-agency and sector coordination to create an ecosystem that supports sustainable agriculture.

**Data Protection and Cybersecurity:** Cybersecurity challenges point to the need for stricter implementation of existing regulations, including improved monitoring and enforcement. Public awareness campaigns and specialized training can be a solution to increase farmers' understanding and engage them in protecting their data. The rapid and widespread adoption of internet technology in Indonesian society has raised new challenges related to personal data security, privacy, and the spread of negative content such as hoaxes, hate speech, and cyberbullying.[10] **Intellectual Property Rights:** The ambiguity in intellectual property rights highlights the need for in-depth review concerning regulation as intellectual property rights cover various aspects, including the presentation, delivery, and use of goods in business. In some cases, intellectual property rights regulations may have led to unclear legal concerns regarding the use and presentation of search-generated products. Regulatory reforms are geared towards creating a clearer and more supportive legal environment for farmers who actively contribute to agricultural innovation.

### **3.2 Relevance of strategic practices and policies for the development of digital-based agriculture**

**Cyber Legal Education and Empowerment:** The discussion underscored the importance of creating educational programs that are not only accessible but also suited to the needs and understanding level of farmers. Empowering farmers through legal literacy will help them become more proactive and aware players in the digital ecosystem. Cyberlegal education and empowerment play an important role in the digital era.[11] Cyber legal education is needed to

ensure that people understand and comply with the laws pertaining to the use of digital technology. In addition, community empowerment through cyber legal education can help in protecting themselves from the threat of cybercrime. For example, empowering community reading parks and elementary school teachers can be one of the strategies in dealing with the cyber pandemic.[12] Role of Government, NGOs, and Private Sector: The conversation highlighted that the government, NGOs, and private sector need to work together to provide holistic and supportive services for farmers. Recommendations focused on strengthening coordination and collaboration among relevant entities to create an ecosystem that supports sustainable and inclusive agriculture. The government has an important role in improving cybersecurity in Indonesia.[13] One of the institutions established by the government to maintain cybersecurity is the National Cyber and Crypto Agency (BSSN). In improving cybersecurity in Indonesia, BSSN refers to five aspects of the Global Cybersecurity Index, namely legal aspects, technical aspects, organizational aspects, capacity building aspects, and cooperation aspects.[14] In addition, the government can also provide education and training on cybersecurity to the community, as was done in the cybersecurity skills improvement training for village site managers. The government can also push cybersecurity issues at the bilateral and multilateral levels.[15]

The discussion underscored the importance of concrete actions and cross-sector collaboration in improving farmer protection and empowerment amidst regulatory complexity and digital transformation. The resulting recommendations are expected to serve as a guide for tangible and sustainable improvement measures.

#### **4 Conclusion**

This article provides a comprehensive overview of the role and impact of cyber law regulations in protecting and empowering farmers in Indonesia in the era of digital transformation of agriculture. In order to provide a clear conclusion, several important points can be identified: (1) Personal Data Protection and Cyber Security: Although cyber law regulations have provided a basis for protection, challenges related to farmers' personal data and cybersecurity remain significant. Cross-sector synergies are needed to improve the implementation and enforcement of regulations, as well as better education of farmers on risks and preventive measures; (2) Farmers' Intellectual Property Rights: The lack of clarity in the protection of farmers' intellectual property rights highlights the need for improvements and enhancements in regulation. Initiatives to incentivize farmers to innovate and protect their creativity are important to support the growth of the agricultural sector; (3) Cyber Legal Education and Empowerment: Challenges in farmers' access to cyber legal education underscore the need for more inclusive and affordable education programs. Farmer empowerment is not only about protecting their rights, but also providing a better understanding of their roles and responsibilities in the digital ecosystem; (4) Role of Government, NGOs, and Private Sector: The role of the government, NGOs, and the private sector is crucial in providing effective support and legal assistance services to farmers. Closer cooperation and better coordination between parties can create an enabling environment for sustainable and inclusive agriculture; (5) Recommendations for Improved Regulation and Implementation: This article provides specific recommendations for improving cyber law regulations, engaging stakeholders in the improvement process, and strengthening inter-agency and sectoral cooperation. As such, this article makes an important contribution in understanding how cyber law regulation can play a key role in protecting and empowering farmers in Indonesia. As technology and agricultural dynamics continue to evolve, the

recommendations generated from this article are expected to form the basis for improvements and positive changes in legal protection and empowerment of farmers in the digital era.

## References

- [1] F. Tjiptasari, "Perkembangan Perpustakaan Tradisional Menuju Digital," *Media Inf.*, vol. 31, no. 1, pp. 33–43, 2022, doi: 10.22146/mi.v31i1.4575.
- [2] N. Yuliani, E. M. Sari Sakti, and D. Gustina, "UMKM Kuliner Jawa Tengah Menuju Transformasi Digital Dalam Menghadapi Tantangan Era Revolusi Industri 4.0," *Ikra-Ith Abdimas*, vol. 7, no. 3, pp. 213–221, 2023, doi: 10.37817/ikra-ithabdimas.v7i3.3038.
- [3] M. P. Aji, "Sistem Keamanan Siber dan Kedaulatan Data di Indonesia dalam Perspektif Ekonomi Politik (Studi Kasus Perlindungan Data Pribadi) [Cyber Security System and Data Sovereignty in Indonesia in Political Economic Perspective Case Study of Personal Data Protecti.," *J. Polit. Din. Masal. Polit. Dalam Negeri dan Hub. Int.*, vol. 13, no. 2, pp. 222–238, 2023, doi: 10.22212/jp.v13i2.3299.
- [4] Anggi Anggraeni Kusumoningtyas and Puspitasari, "Dilema Hak Perlindungan Data Pribadi dan Pengawasan Siber: Tantangan di Masa Depan," *J. Legis. Indones.*, vol. 21, no. 1, pp. 234–250, 2020, doi: 10.54629/jli.v17i2.706.
- [5] Y. Kirana, "Regulasi yang Mengatur secara khusus terkait Perlindungan Data Pribadi di Indonesia tentang Hoaks dan Kerawanan Media Sosial," *J. Ilm. Huk. dan Keadilan*, vol. 10, no. 1, pp. 101–114, 2023, doi: 10.59635/jihk.v10i1.274.
- [6] S. A. Sholikhatin, P. Pribadi, A. Pratiwi, and D. A. Anggara, "Sosialisasi Security Awareness dan Perlindungan Data Pribadi Di Media Sosial Pada Smk Maarif NU 1 Cilongok," *SELAPARANG J. Pengabd. Masy. Berkemajuan*, vol. 7, no. 3, pp. 1517–1521, 2023, doi: 10.31764/jpmb.v7i3.16024.
- [7] D. Rachmat, "Singkronisasi Penafsiran Hukum Perkawinan Tiga Sistem Hukum Perspektif KUHPerdara, Undang-Undang Perkawinan dan Kompilasi Hukum Islam," *J. Huk. Respublica*, vol. 17, no. 2, pp. 292–308, 2018.
- [8] M. Ihsan, "Perlindungan Hukum Bagi Pemulia Varietas Tanaman (Petani) Pasca lahirnya Undang-Undang Nomor 22 Tahun 2019 tentang Sistem Budi Daya Pertanian Berkelanjutan," *SALAM J. Sos. dan Budaya Syar-i*, vol. 8, no. 3, pp. 867–880, 2021, doi: 10.15408/sjsbs.v8i3.20951.
- [9] D. Afifah, "Perlindungan Konsumen Di Sektor Jasa Keuangan Pada Kasus Serangan Siber Ransomware Yang Menimpa Perbankan," *JIIIP - J. Ilm. Ilmu Pendidik.*, vol. 6, no. 11, pp. 9318–23, 2023, doi: <https://doi.org/10.54371/jiip.v6i11.3176>.
- [10] R. Pambudi, A. Budiman, A. W. Rahayu, A. N. R. Sukanto, and Y. Hendrayani, "Dampak Etika Siber Jejaring Sosial Pada Pembentukan Karakter Pada Generasi Z," *J. Syntax Imp. J. Ilmu Sos. dan Pendidik.*, vol. 4, no. 3, pp. 289–300, 2023, doi: 10.36418/syntax-imperatif.v4i3.262.
- [11] J. Satrio, S. Maryam, A. Ummah, and D. Tri Saputra Wahidin, "Peningkatan Keterampilan Keamanan Siber bagi Pengelola Situs Desa Baros Kabupaten Serang," *J. Inov. Pengabd. dan Pemberdaya. Masy.*, vol. 2, no. 2, pp. 135–142, 2022, doi: 10.54082/jipm.35.
- [12] F. Abdullah, S. Suhadi, C. P. Tertia, A. R. Tarigan, A. Andri, and F. Fahrezi, "Pemberdayaan Taman Baca Masyarakat dan Guru Sekolah Dasar dalam Menyasiasi Pandemi Siber: Gotong Royong melalui Digital Civic Engagement," *Publ. Pendidik.*, vol. 11, no. 2, p. 158, 2021, doi: 10.26858/publikan.v11i2.16438.

- [13] V. S. Purborini, "Pentingnya Pendidikan Hukum Islam di Era Digital," *PROGRESSA J. Islam. Relig. Instr.*, vol. 7, no. 1, pp. 91–102, 2023, doi: 10.32616/pgr.v7.1.436.91-102.
- [14] A. Haryanto and S. M. Sutra, "Upaya Peningkatan Keamanan Siber Indonesia oleh Badan Siber dan Sandi Negara (BSSN) Tahun 2017-2020," *Glob. Polit. Stud. J.*, vol. 7, no. 1, pp. 56–69, 2023, doi: 10.34010/gpsjournal.v7i1.8141.
- [15] H. S. Jose, "Politisasi Agenda Keamanan Siber Pada Era Industri 4.0 di Forum Multilateral," *Populika*, vol. 9, no. 2, pp. 70–85, 2021, doi: 10.37631/populika.v9i2.390.