



International Journal of New Approaches to Law and Rationality in
Nationhood, Governance, and Rights Advocacy

Nalarnagara Journal

Vol. 1, No. 3, July 2026 pp. 1224-1229

Journal Page is available at <https://internationaljournal.lppmunsaka.ac.id/index.php/nalarnagara>



**Assessing Legal Gaps in Indonesia's Gender-Disaggregated Data Governance Using
Artificial Intelligence**

Ratna Ayu Widiawari^{1*}, Ni Made Jaya Senastri², Luh Putu Suryani³

^{1,2,3}Warmadewa University

Email: ratnaayu@warmadewa.ac.id

Abstract

Data collected and reported separately for women, men, and diverse gender identities called gender disaggregated data is essential for identifying inequalities, supporting inclusive policymaking, and monitoring progress toward global development commitments such as the Sustainable Development Goals (SDGs). However, many countries face a persistent “gender data gap,” characterized by incomplete or poorly governed gender-specific data. This research examines the legal importance of gender-disaggregated data and evaluates whether Indonesian legal frameworks adequately regulate its collection, governance, and protection. Using a normative legal research approach, the study analyzes key Indonesian laws, including Law No. 16 of 1997 on Statistics, and Presidential Regulation No. 39 of 2019 on One Data Indonesia (Satu Data Indonesia), in relation to international commitments such as CEDAW and the SDGs. The findings indicate that existing regulations do not explicitly mandate systematic gender-disaggregated data collection, creating regulatory gaps. The study proposes the use of combination of doctrinal legal analysis with artificial intelligence tools to map legal provisions and identify the gaps, supporting more inclusive and evidence-based data governance frameworks that advance gender equality.

Keywords: Gaps, Gender Disaggregated Data, Artificial Intelligence

INTRODUCTION

There are approximately 1.1 billion girls in developing countries who face the risk of being excluded from development progress. The global adoption of the Sustainable Development Goals (SDGs) and their associated indicators present a crucial opportunity to improve the well-being and empowerment of these vulnerable populations. However, effective accountability in the SDG era relies heavily on data, and for nearly two-thirds of the indicators relevant to girls, such data is either insufficient or entirely unavailable. Even when data exists, it is often underutilized or not presented in accessible, user-friendly “open data” formats that can support meaningful analysis and decision-making. (Graduate Woman International, 2016)

Gender-disaggregated data (GDD) is information collected and analysed separately for males and females to reveal, analyse, and address gender-based disparities. It is essential for identifying inequalities, designing inclusive policies, and monitoring progress toward global development goals such as the Sustainable Development Goals (SDGs). (United Nations Statistics Division, 2016). Regular and systematic collection of gender-disaggregated data is important for tracking how inequalities emerge, persist, or shift over time, while also establishing reliable baseline indicators. By maintaining consistent data collection, policymakers and lawmakers can better identify trends, measure disparities, and monitor whether gaps are widening or narrowing. Such longitudinal data supports evidence-based analysis and enables the evaluation of whether policies and programs effectively reduce inequality and its broader social and economic impacts.

Moreover, robust data collection and evaluation are essential for assessing the effectiveness and relevance of policies. Reliable and well-structured data allows governments to make informed decisions based on evidence rather than assumptions. Through continuous monitoring, policymakers can identify what works and what does not, generating insights that improve future strategies and strengthen overall governance outcomes. Despite its importance, large gaps remain in the availability, production, and accessibility of gender-disaggregated data worldwide. Research consistently identifies a “gender data gap,” which is also evident in several Indonesian laws and regulations, manifested in unsystematic data collection practices, insufficient standardization, and weak governance of data concerning women and gender minority groups. Significant legal and regulatory gaps persist in ensuring the consistent collection, governance, and use of such data, motivating the need for innovative approaches like artificial intelligence to systematically map and address these shortcomings.

In Indonesia, several laws regulate public data collection and governance such as Law No. 16 of 1997 on Statistics and Presidential Regulation No. 39 of 2019 on One Data Indonesia (Satu Data Indonesia). However, these legal instruments do not clearly establish comprehensive requirements for gender-disaggregated data across government sectors. These gaps often stem from outdated laws, ambiguous mandates, and insufficient data protection frameworks, which collectively contribute to persistent inequalities in data representation, especially for women and gender minorities (Criado-Perez, 2019; Taylor, 2016). Moreover, the rise of artificial intelligence and algorithmic systems amplifies the urgency to address these legal gaps, as biased or incomplete gender data can perpetuate discrimination and reduce the effectiveness of automated decision-making processes (Barocas, Hardt, & Narayanan, 2019). By leveraging AI, researchers and policymakers can more effectively identify and map these legal shortcomings, enabling targeted reforms that improve data inclusivity, transparency, and accountability (D’Ignazio & Klein, 2020). This approach not only strengthens governance but also supports the global commitment to gender equality enshrined in the SDGs.

This research therefore examines the extent to which existing Indonesian legal frameworks support the production and governance of gender-disaggregated data and explores how artificial intelligence (AI) can assist in assessing legal gaps within these frameworks. The study addresses two main research questions: How adequately do current Indonesian laws regulate for the systematic collection, standardization, and governance of gender-disaggregated data? and how can AI-assisted assessment of legal gaps in gender disaggregated data governance enhance legal frameworks for gender equality and lawmaking in Indonesia?

METHODS

This study relies on normative legal methodology, which focuses on interpreting and evaluating legal norms, statutes, and principles to determine their adequacy in regulating gender-disaggregated data in Indonesia, focusing on Law No. 16 of 1997 on Statistics, and Presidential Regulation No. 39 of 2019 on One Data Indonesia (Satu Data Indonesia). By combining doctrinal legal analysis with AI-assisted mapping, it is possible to visualize gaps, overlaps, and ambiguities in current laws, enabling a systematic assessment of how legal frameworks support or fail to support gender equality objectives. Such a method aligns with both traditional legal scholarship and emerging interdisciplinary approaches at the intersection of law, data governance, and technology.

RESULTS & DISCUSSION

1. Legal Regulations of Collecting, Standardization, and Governance of Gender Disaggregated Data in Indonesia

The multifaceted nature of gender discrimination and inequalities, coupled with the vast reach of the digital economy, creates the need for strategies that account for a multitude of social and economic issues. If policymakers are to take appropriate and effective action to address these issues, they need comprehensive and accurate data that capture the realities of different categories of people. (Sey 2023) Nowadays, data plays an increasingly central role in shaping nearly every dimension of modern life, including healthcare, transportation, economic systems, and responses to crises. However, much of the data currently available has been predominantly derived from (white) male populations. This imbalance has led to what is known as the Gender Data Gap, a phenomenon characterized by the underrepresentation or absence of data on women. (Sperber et al. 2023)

Indonesian legislation provides a general foundation for data collection and governance. However, it clearly shows the lack of explicit mandates for gender-disaggregated data. Law No. 16 of 1997 on Statistics enables sectoral and national data collection. Over the past few years, fundamental changes have occurred that have affected the implementation of statistical activities. First, the increasing welfare of society as a result of national development has led to a growing diversity in the statistical data required by the public including gender disaggregated data. Second, types of data that in the early 1960s were sufficiently collected by the Central Bureau of Statistics (BPS) now require the involvement of other statistical activity organizers outside the Agency. Third, advancements in science and technology have had an impact on the development of statistical activities. Fourth, there have been changes in the strategic environment, such as the era of globalization, which is characterized, among other things, by greater openness, increased competition, the rapid flow of statistical information, and the expanding role of statistical information for both the government and society. However, this law does not adequately provide for standardized gender-specific reporting. Therefore, AI-assisted approaches can help address gaps and improve the availability of gender-disaggregated data.

Furthermore, on Article 5 of this Law specifies the types of data based on their intended use, which consist of: basic statistics; sectoral statistics; and special statistics. Despite this classification, the provision does not explicitly regulate or mandate the collection, standardization, or governance of gender-disaggregated data. The absence of such provisions suggests that gender considerations are not systematically embedded within the national statistical framework. As a result, data produced under these categories may overlook gender-specific dimensions, limiting the ability of policymakers to identify and address gender inequalities effectively. The Law also regulates the methods of data collection, including censuses, surveys, and administrative data compilation. However, it does not specifically require or mandate that these implementation methods produce gender-disaggregated data. This indicates that, while the legal framework provides general procedures for statistical production, it does not explicitly integrate gender-based classification as a standard requirement in data collection practices. Consequently, the lack of explicit legal obligations for gender-disaggregated data further reinforces the gap in Indonesia's statistical governance framework, where gender perspectives remain optional rather than systematically institutionalized.

Presidential Regulation No. 39 of 2019 on One Data Indonesia (Satu Data Indonesia) establishes a national framework for improving data governance across government institutions through standardization, coordination, and data quality assurance. It aims to ensure that government data is consistent, interoperable, and properly managed under a unified national system. However, while the regulation significantly strengthens overall data governance, it does not explicitly require the collection or standardization of gender-

disaggregated data as a mandatory category. Gender based classification is therefore not formally embedded within the One Data framework. Law on personal data protection only also focuses on privacy rather than systematic collection or standardization for policy purposes. (Barocas, Hardt, and Narayanan 2019) Furthermore, international guidelines and best practices emphasize that effective gender-responsive governance relies not only on data collection but also on clear legal mandates for standardization, quality control, and reporting mechanisms.

This absence limits the potential for systematically integrating gender perspectives into national data systems and restricts the ability to generate reliable, comparable, and timely gender-disaggregated statistics, which in turn affects the availability of evidence needed for gender-responsive policymaking and for monitoring compliance with both national and international commitments, including the Sustainable Development Goals and the CEDAW (Convention on the Elimination of All Forms of Discrimination Against Women) framework (UN Women 2018; Huyer 2016). Collectively, these laws create a normative gap, as gender-disaggregated data remains fragmented and inconsistently governed, limiting its legal and policy utility.

2. Using AI-Assisted Assessment to Identify Legal Gaps in Gender-Disaggregated Data Governance

Artificial Intelligence (AI)-assisted mapping can systematically analyse legal texts to identify omissions, inconsistencies, and gaps related to gender-disaggregated data across Indonesian regulations. Techniques like natural language processing and semantic analysis enable visualization of where laws fail to mandate gender-specific reporting or governance standards. (Taylor 2016; Barocas, Hardt, and Narayanan 2019) By processing large volumes of legal texts, AI tools can identify patterns such as:

- absence of gender-related terminology in statistical laws
- lack of mandatory disaggregation requirements
- inconsistent definitions of gender categories across regulations
- fragmentation between national and sectoral data governance frameworks

Such computational approaches enhance traditional legal analysis by increasing speed, scale, and accuracy in detecting normative gaps. Research on AI governance highlights that algorithmic tools can help reveal hidden biases and omissions in policymaking structures, particularly where human review alone may overlook systemic issues (Lütz 2024)

In terms of advancing gender-equitable use, Artificial intelligence has the potential to reduce structural inequalities when it is developed with fairness principles embedded in areas such as employment, education, and public service delivery. Emerging tools are already being used to detect bias in job postings, support more inclusive recruitment processes, and generate new digital income opportunities for women in informal employment. In addition, adaptive learning technologies designed for girls with limited access to digital resources are helping to narrow existing educational disparities. (Kim and Kong 2025)

The use of artificial intelligence is also implicitly accommodated under the Law No. 16 of 1997 on Statistics, although not explicitly mentioned. Articles 11–13 allow data to be obtained through methods that evolve in line with developments in science and technology, thereby opening space for the use of AI-assisted approaches in data processing and analysis. In this context, AI can support legal assessment by identifying patterns, inconsistencies, and gaps within data governance frameworks, including those related to gender-disaggregated data.

However, despite its potential, AI-assisted legal assessment is not neutral. Bias in training data, limited transparency, and challenges in interpretability may affect the reliability of its outputs. Without appropriate safeguards, AI systems risk reinforcing existing inequalities rather than addressing them. Effective AI governance must be intersectional,

enforceable, and inclusive. (Cupac n.d,2025) Therefore, AI should be understood as a complementary tool rather than a substitute for human legal reasoning. Its effective use depends on transparency, ethical governance, and interdisciplinary oversight involving legal experts, data scientists, and gender specialists. When combined with normative legal analysis, AI-generated insights can assist policymakers in identifying regulatory gaps, harmonizing legal provisions, and developing evidence-based policies that better promote gender equality. In this way, AI helps transform fragmented data and dispersed legal texts into actionable knowledge, ultimately strengthening Indonesia's legal framework for gender-responsive governance (UN Women 2018).

CONCLUSION

Law No. 16 of 1997 on Statistics and Presidential Regulation No. 39 of 2019 on One Data Indonesia establish the framework for national and sectoral data governance. However, they do not ensure the systematic collection or reporting of gender-disaggregated data. This creates a normative gap that limits the integration of gender perspectives, weakens data reliability, and reduces the evidence base for gender-responsive policymaking, as well as monitoring commitments such as the SDGs and CEDAW. In this context, AI-assisted assessment offers a valuable tool to identify legal gaps and inconsistencies. When combined with normative legal analysis, it can support more targeted and evidence-based reforms, strengthening the governance and use of gender-sensitive data in Indonesia.

Acknowledgments

The author) would like to express sincere gratitude to Faculty of Law Warmadewa University for supporting this research. The authors also acknowledge the assistance of the conference host, co-hosts for any technical support, whose contributions were instrumental in completing this work. Finally, the authors appreciate the reviewers and editors for their constructive comments, which significantly improved the quality of this manuscript.

REFERENCES

- Barocas, Solon, Moritz Hardt, and Arvind Narayanan. *Fairness and Machine Learning: Limitations and Opportunities*. Cambridge, MA: MIT Press, 2019. <https://doi.org/10.1561/22000000079>.
- Cupac Jelena, *The Gender Code: Gendering the Global Governance of Artificial Intelligence*, Handbook on the Global Governance of Artificial Intelligence, forthcoming with Edward Elgar Publishing 2025, <https://doi.org/10.48550/arXiv.2512.09570>
- Criado-Perez, C. *Invisible women: Data bias in a world designed for men*. Abrams Press, 2019 DOI:10.7196/SAMJ. 2020.v110i9.15131
- D'Ignazio, Catherine, and Lauren F. Klein. "Feminist Data Visualization." *IEEE Computer Graphics and Applications* 40, no. 3 (2020): 22–30. <https://doi.org/10.1109/MCG.2020.2985818>.
- Graduate Women International, "Policy Update" 2016, <https://www.graduatewomen.org/wp-content/uploads/2016/12/2016-12-GWI-PolicyUpdate-Gender-data.pdf>
- Huyer, Sophia. "Closing the Gender Data Gap in Agriculture." *Gender Technology and Development* 20(2) (2016): 1–13. DOI:10.1177/0971852416643872
- Kim, Jinha, and Byeongjo Kong. 2025. *Bridging the Digital Divide*: 0 ed. ADB Briefs. Asian Development Bank. <https://doi.org/10.22617/BRF250419>.
- Sey Araba, *Availability of Gender-Disaggregated Data on the ASEAN Digital Economy*, Eria Discussion Paper Series No. 468, 2023

- Sperber S, Täuber S, Post C, Barzantny C. “Gender Data Gap and its impact on management science — Reflections from a European perspective” *European Management Journal* Volume 14 (1) (2023), DOI10.1016/j.emj.2022.11.006
- Taylor, Linnet. “What Is Data Justice? The Case for Connecting Digital Rights and Freedoms Globally.” *Big Data & Society* 3, no. 2 (2016): 1–14.
<https://doi.org/10.1177/2053951716679679>.
- UN Women. *Turning Promises into Action: Gender Equality in the 2030 Agenda for Sustainable Development*. New York: UN Women, 2018.
- United Nations Statistics Division, *Integrating a gender perspective into statistics*. United Nations. <https://unstats.un.org/unsd/genderstatmanual/> 2016.