

Digital Governance for Sustainable Mobility in Indonesia: Insights from a Bibliometric Analysis of Public Policy and Climate Action

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ABSTRACT:

This study aims to map the development, knowledge structure, and research trends of digital governance in relation to sustainable mobility, public policy, and climate action. A bibliometric approach was employed using VOSviewer and R-Bibliometrix. Data were collected through a literature search using the keywords “sustainable mobility”, “governance”, “public policy”, and “Indonesia”. From an initial search of 1,214 publications, 620 publications were selected as the final dataset after screening based on their relevance to sustainability and governance themes. The findings reveal three main research clusters: public service and transparency, digital transformation and performance, and climate change and environmental governance. These clusters indicate that digital technologies, including e-government, big data, and blockchain, not only improve public service efficiency but also strengthen accountability, public participation, and governance capacity in responding to climate-related risks. This study contributes by providing a conceptual mapping of the relationship between digital governance, sustainable mobility, and climate action in Indonesia. Future research should empirically examine how digital technologies are implemented at regional and community levels to support sustainable transportation policies and climate adaptation.

INTRODUCTION

The main question addressed in this study is how digital governance has been positioned in the academic literature as a policy instrument for supporting sustainable mobility and climate action in Indonesia. This question emerges from Indonesia’s increasingly complex environmental challenges, including urban environmental degradation, rising transportation-related emissions, rapid urbanization, and heightened vulnerability to climate change. These challenges indicate that environmental problems cannot be addressed solely through sectoral policies or technological adoption, but require a

more integrated governance approach that combines public policy coordination, digital innovation, institutional capacity, and citizen participation. Sustainable mobility is particularly relevant in this context because transportation systems are closely linked to carbon emissions, air pollution, energy transition, and urban resilience. However, existing studies remain fragmented across digital government, environmental governance, public policy, and sustainable transportation, making it difficult to identify how these bodies of literature intersect. This study therefore uses bibliometric analysis to map research trends, thematic clusters, and knowledge

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structures at the intersection of digital governance, sustainable mobility, and climate action in Indonesia (Adnan et al., 2021). By 2045, over 58.6% of Indonesia's projected population of 280 million will reside in cities, making sustainable urban development an urgent necessity (Annahar et al., 2023). Urbanization, while driving economic growth, intensifies inequalities, accelerates environmental degradation, and heightens vulnerabilities to climate change (Zhang et al., 2016). Consequently, addressing these issues demands a holistic approach that not only enhances safety and air quality but also improves the overall quality of life in urban areas (Shannon et al., 2018).

The Indonesian government has demonstrated a commitment to sustainable mobility through various initiatives, including incentivizing the adoption of electric and hybrid vehicles, optimizing public transportation, and fostering corporate social responsibility (Castella et al., 2022). Furthermore, the development of Nusantara as a new capital city presents a unique opportunity to integrate sustainable mobility principles from the outset, serving as a model for future sustainable cities Shimamura & Mizunoya, (2020) this paper evaluates the impact and sustainability of

the Indonesian government's decision to relocate the capital city from Jakarta to East Kalimantan in terms of economic, human, and environmental aspects. This paper develops an integrated prediction simulation model based on IW and system dynamics and sets three scenarios, depending on the expected population recovery in Jakarta and the increased immigration into the new capital city (NCC). This report examines the structural challenges that Indonesia faces in transforming its governance to achieve sustainable mobility, exploring the latest developments, policy strategies, and collaborative efforts aimed at creating a greener and more sustainable future (Widyawati et al., 2023) which are part of the strategy of the Provincial Government of East Kalimantan. Even so, 72% of the problems culinary and craft SMEs face in Samarinda City are related to competitive advantages. Culinary and craft SMEs in Samarinda City are still constrained by competitive disadvantage, especially in the non-substitutable resource aspect. This study aimed to analyze the effect of organizational capital and health on competitive advantage, especially in the era of post-COVID-19 economic recovery through the creative economy. This study used a survey method with a quantitative

Table 1. A Domain-Optimized Research Report

Initiative	Description	Goal
Bali E-mobility Project	Piloting electric vehicle systems and developing a green transportation investment roadmap for Bali	Contribute to Indonesia's net-zero goal by 2050 and position Bali as a global leader in eco-tourism Ruddyard, 2025
Project Implementation Arrangement	Formalizing the project governance structure and detailed implementation agreements	Reduce greenhouse gas emissions from Bali's transport sector and demonstrate the viability of electric buses for public transport in provincial cities Fraser, 2025

Source: Processed Data

approach. The analysis techniques used were descriptive analysis and factor analysis using structural equation modeling with item parceling. The subjects of this study were SMEs in the culinary and craft sub-sector in Samarinda City (N = 365 SMEs).

Sustainable mobility has been increasingly discussed in the literature as a multidimensional governance issue rather than a purely transportation or technological agenda. Prior studies emphasize that the transition toward low-carbon mobility requires not only electric vehicle adoption and infrastructure development, but also policy integration, institutional coordination, digital innovation, and public accountability. In Indonesia, this issue has become more urgent due to rapid urbanization, environmental degradation, transportation-related emissions, and growing exposure to climate risks. Recent policy initiatives, including the collaboration between Bappenas, GGGI, and the Republic of Korea in promoting sustainable transportation and the development of an electric vehicle ecosystem under the RPJPN 2025–2045 framework, illustrate the increasing relevance of sustainable mobility in Indonesia's energy transition agenda. Nevertheless, the academic literature has not yet systematically explained how digital governance is positioned within this transition. Existing studies remain scattered across e-government, climate governance, public policy, and sustainable transportation, creating a fragmented understanding of how digital tools can support climate-oriented mobility governance. This gap justifies the need for a bibliometric review to map the intellectual structure, thematic clusters, and research trends linking digital governance, sustainable mobility, and climate action in Indonesia (Lee et al., 2022) necessitating urgent actions to forestall future water crises. However, achieving this goal

requires the involvement of stakeholders to develop an effective governance policy concerning water saving. This study investigates the components of water governance following existing water policy gaps. A multi-level Delphi-AHP technique was used to identify and prioritize the essential components of agricultural water governance that can specifically enhance water-saving policy in Korea. The analysis of twenty-nine formulated components (six main and twenty-three sub-components).

Bali provides an important policy context for understanding the link between sustainable mobility, climate action, and digital governance in Indonesia. The province has established regulatory foundations through Governor Regulation Number 45 of 2019 on Clean Energy and Governor Regulation Number 48 of 2019 on the Use of Battery-Based Electric Motor Vehicles, which support the acceleration of vehicle electrification and public transport transformation. These policies are highly relevant because the transportation sector contributes approximately 43% of Bali's total greenhouse gas emissions, while the provincial government targets a reduction of 41,516 tons of greenhouse gas emissions by 2026 through sustainable transportation initiatives. However, the existence of these regulations does not automatically explain how digital governance supports policy coordination, public accountability, data-driven decision-making, and climate-oriented mobility transformation. This reveals the main research gap of this article: previous studies and policy discussions have largely examined sustainable transportation, electric vehicles, climate action, and digital governance separately, while their interconnection remains insufficiently mapped in the Indonesian context. The novelty of this study lies in its bibliometric review of how academic literature connects digital governance, sustainable mobility, public policy, and

climate action. Therefore, this article offers a conceptual mapping and research agenda that can help scholars and policymakers identify dominant themes, knowledge gaps, and future directions for strengthening digital governance in sustainable mobility transitions (Fraser & Van der Ven, 2022).

LITERATURE REVIEW

Policy and Governance Frameworks

Indonesia's commitment to sustainable mobility is reflected in several policies and frameworks that integrate environmental concerns into urban planning and transportation. Key government actions include providing incentives for electric and hybrid vehicle adoption, prioritizing public transportation investment to improve accessibility, and promoting CSR initiatives to reduce emissions through carpooling and telecommuting (Kartadjumena & Rodgers, 2019). Moreover, the use of data technologies such as IoT and virtual twin simulations is being explored to create an integrated mobility ecosystem, optimizing traffic flow and reducing emissions (Nasih et al., 2019). However, despite these strong policies, the literature often overlooks the local-level challenges related to bureaucratic hurdles and the need for interagency coordination (Kuntorini et al., 2022). A more comprehensive evaluation of these policies at the local implementation level is necessary to assess their effectiveness and identify areas for improvement (Ninghardjanti et al., 2023) the government implements the Smart Indonesia Program (SIP).

Cross-Disciplinary Insights

The transformation of urban governance in Indonesia requires a multidisciplinary approach. Technologies such as IoT and virtual twins can improve traffic management and reduce emissions, while environmental sciences help measure and mitigate the impacts of transportation

(Wijaya et al., 2020). Economic analysis, meanwhile, identifies sustainable financing mechanisms and investment opportunities. A successful governance transformation will depend on integrating these diverse fields to address complex challenges, as sustainable mobility cannot be solved from a single disciplinary perspective (Sachs et al., 2019).

Structural Challenges in Transforming Governance

Despite the government's commitment and various initiatives in place, Indonesia faces several structural challenges in transforming governance for sustainable mobility. These challenges include policy continuity, which is critical to ensuring sustained support for mobility initiatives despite changes in local government leadership (Kopanaki & Stamoulis, 2025); the need for substantial investment and financing through Public-Private Partnerships (PPP) and other innovative mechanisms (Alsabt et al., 2024); the creation of a regulatory environment conducive to supporting urban development and sustainable transportation (Caballini et al., 2023); the development of infrastructure needed to support electric vehicles and public transport systems (Tan, 2023); and social protection issues related to coverage, adequacy, and sustainability of programs for workers predominantly in the informal sector (Oudani, 2023). Overcoming these challenges requires coordinated efforts across all levels of governance and society, focusing on inclusive governance, innovative financing, and institutional capacity building (Duan et al., 2020).

The Role of Nusantara in Sustainable Mobility

The development of Nusantara as Indonesia's new capital presents a significant opportunity to integrate sustainable mobility principles from

the outset (Arfiansyah et al., 2024) such as agriculture, urban development, conservation, or infrastructure projects. This paper integrates multi-criteria analysis (MCA). By adopting an integrated approach to urban planning and transportation design, Nusantara has the potential to become a model for sustainable cities (Lin et al., 2023). Key strategies for achieving sustainable mobility in Nusantara include implementing IoT-based infrastructure to optimize traffic flow (Parlina et al., 2021); using virtual twin technology for simulation and optimization of transportation scenarios (Dong et al., 2022); adopting smart parking solutions and shared mobility services (Arfiansyah et al., 2024); and creating pedestrian-friendly infrastructure, dedicated bike lanes, and green spaces to promote active transportation modes (Sun et al., 2023). By embracing a holistic and collaborative approach, Nusantara can lead the way towards a more environmentally friendly transportation system and become an example for global sustainable development (AL-Mohannadi et al., 2023). Although Nusantara offers significant potential as a model for a sustainable city, literature on the development of new cities often highlights challenges in ensuring

inclusive community participation or avoiding ‘greenwashing’ (Li & Lou, 2024). Therefore, the success of Nusantara will heavily depend on careful and inclusive implementation.

METHODS

This study uses bibliometric analysis to assess the state of research on governance and sustainable mobility in Indonesia (Rejeb et al., 2021). Bibliometric methods are well-suited for mapping the landscape of existing research and identifying trends in governance practices related to sustainable mobility (Guo & Donev, 2020). Data for this analysis were collected from databases using keywords such as “sustainable mobility”, “governance”, “public policy”, and “Indonesia” on July 4, 2025. R- Bibliometrik and VOSviewer was employed to generate descriptive statistics and network visualizations to identify relationships between these research topics.

The second stage of this study focused on data screening and refinement. The initial search process generated 1,214 publications using Boolean search strings that combined the terms “Sustainable” OR “Sustainability” AND “Governance.” Subsequently, the titles, abstracts,

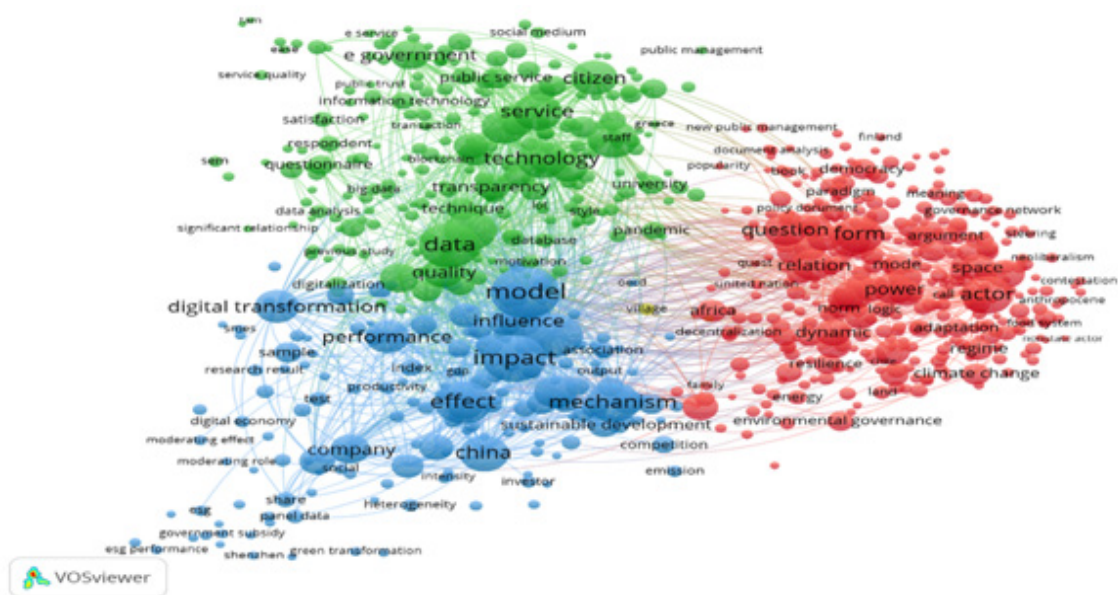


Figure 1. Network Map about of Sustainable Governance

and author keywords of these records were carefully reviewed to assess their relevance to the research focus. Through this screening process, 620 publications were identified as directly related to the intersection of sustainability, and governance. Studies that did not explicitly address these interconnections, particularly those limited to technical or engineering discussions without policy or governance relevance, were excluded from the final dataset. This procedure was undertaken to ensure that the bibliometric analysis was based on a focused and methodologically robust corpus of literature.

This bibliometric analysis will provide a comprehensive understanding of the current state of governance practices in Indonesia, highlighting areas where further research and improvement are needed (Wahyuningrum et al., 2023). Additionally, the study will explore the implications of these findings for policy development, identifying gaps and opportunities for improving public sector governance in the context of sustainable mobility (Chen et al., 2018).

RESULT AND DISCUSSION

The results presented in this analysis are derived from a comprehensive VOSviewer network map (Liu et al., 2022), which visualizes key relationships between terms related to sustainable governance, digital transformation, and climate change (Sorsa & Sánchez, 2024). The network identifies three main clusters representing major themes in the literature: public service and transparency, digital transformation and performance, climate change and environmental governance. These clusters reveal not only the prominent topics within the research on sustainable mobility and governance but also highlight emerging patterns of integration between technology, public policy, and environmental goals. This discussion aims to unpack the

implications of these findings, exploring the key connections between topics and how these may influence Indonesia's governance transformation, particularly in the context of urban mobility and sustainable development.

Green Cluster: Public Service and Transparency

This cluster emphasizes the relationship between public service, citizen satisfaction, and data transparency. The connections between terms like e-government, public service, citizen trust, and data analysis highlight the critical role that digital technology plays in enhancing the quality of public services and government accountability. The presence of terms like big data and digital platforms signifies that when governments use these technologies effectively, they can improve public engagement, thereby increasing the trust citizens have in their government. Data transparency is key to ensuring that these digital transformations are accepted and that citizens feel involved in the decision-making process. The adoption of digital platforms and e-government can significantly improve transparency and service delivery. However, this requires robust policies to ensure that data management is handled securely and transparently. Furthermore, public participation should be encouraged to leverage these technological advancements for greater civic involvement.

Blue Cluster: Digital Transformation and Performance

The blue cluster reveals the intersection of digital transformation and organizational performance. Key terms like digital economy, performance, and research results emphasize the substantial role that digital technologies play in improving efficiency and organizational performance, both in the public and private sectors.

The presence of terms such as company and China suggests that the influence of global technological developments, particularly in China, may have an impact on governance and performance metrics worldwide, and could offer insights into how digital technologies can optimize both governance and private sector operations. The implementation of digital technologies offers a great opportunity to enhance government performance. However, challenges such as widening access and training for public sector employees are critical for the successful application of these technologies. Therefore, investment in infrastructure and capacity building should be prioritized to ensure that all stakeholders can benefit from digital transformation.

Red Cluster: Climate Change and Governance

The red cluster focuses on climate change, adaptation, resilience, and environmental governance. The presence of terms like regime, power, and adaptation underscores the political dimensions of climate change governance. It shows that addressing climate change is not just about implementing environmental policies but also about managing power relations

among state and non-state actors involved in shaping environmental strategies. The inclusion of terms such as emissions, energy, and sustainability highlights the pressing need to integrate environmental governance within political and economic agendas to reduce the negative impacts of climate change. Climate change governance requires a multifaceted approach involving cooperation among governments, businesses, and civil society. Effective policy frameworks must address not only environmental challenges but also political, social, and economic factors. Public participation and the involvement of non-state actors are essential for developing comprehensive climate change solutions.

The findings underscore the strong connections between digital transformation, public governance, and climate change. The public service and transparency cluster reveals the importance of digital tools in improving service quality and government accountability, while the digital transformation and performance cluster shows that technology adoption is a key driver of enhanced governance efficiency. The climate change and environmental governance cluster

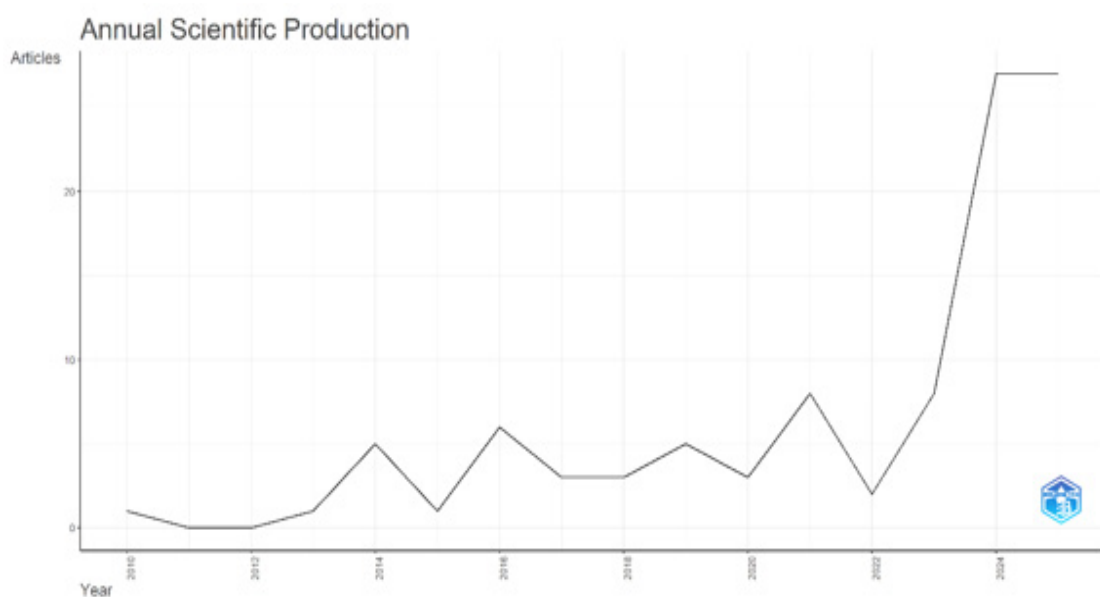


Figure 2. Scientific Production

highlights the need for global collaboration and public participation in tackling climate change, emphasizing that solutions require multi-sectoral involvement. This analysis suggests that sustainable governance in Indonesia needs a holistic approach that integrates digital technologies, climate change adaptation, and institutional capacity building. Cross-sector collaboration and the use of innovative technologies will be critical in achieving sustainable mobility and environmentally friendly urban development in the future.

Building on the findings regarding the interconnectedness of digital transformation, public governance, and climate change, the chart illustrating annual scientific production further emphasizes the increasing research output in these domains. The sharp rise in publications from 2020 onwards indicates a growing interest in these areas, likely driven by global challenges such as the COVID-19 pandemic, the urgent need for climate action, and the accelerating digital transformation in public governance. This trend underscores the heightened attention in academic and policy circles toward integrating digital solutions in governance and addressing the climate crisis. The surge in publications is reflective of a global shift toward data-driven solutions and technological innovations aimed at solving complex governance issues. The exponential increase in scientific output aligns with the broader global research agenda focused on sustainability, innovation, and collaborative governance.

The sharp increase in scientific publications observed in the past few years, especially from 2020 onward, highlights a significant shift in academic focus towards the intersection of digital transformation, public governance, and climate change. This surge in publications directly correlates with the growing urgency of addressing global challenges. The timing of

this rise coincides with major global events, particularly the COVID-19 pandemic, which drastically accelerated the adoption of digital technologies in governance, education, and business. Governments worldwide had to embrace digital tools for remote work, public service delivery, and communication, which in turn spurred an increased interest in researching digital governance models and data-driven public administration.

Beyond the pandemic's influence, the environmental challenges and the push for climate resilience have also significantly contributed to the increased research output. Over the last few years, climate change and sustainability have become key concerns for global governance. The academic community has responded by amplifying studies related to sustainable urban mobility, green technologies, and climate adaptation strategies. This rising body of literature reflects a broader recognition of the need to transition toward sustainable cities, green infrastructure, and low-carbon transportation systems areas that are increasingly integrated into public policy agendas across the globe.

Moreover, the rapid rise in publications during the period following 2020 suggests a broader academic commitment to finding innovative solutions that combine technological advancements with environmental sustainability. Scholars are exploring how digital platforms, IoT technologies, and big data can be leveraged to tackle governance issues, from improving public service efficiency to enhancing urban resilience to climate change. These developments underscore the growing understanding that digital transformation and climate governance are not isolated topics but are increasingly interconnected in addressing the complexities of modern governance.

This surge in scientific output further reflects a global pivot toward

holistic approaches to governance, where technology and environmental sustainability are viewed as intertwined solutions for addressing contemporary issues. As we move forward, the increasing research output points to an era where collaborative governance, backed by innovative technologies, will likely dominate efforts to meet sustainability goals and climate targets. The growth in scientific literature is not just a reflection of academic interest but also an indication of the global community's recognition of the need to integrate technological solutions with environmental strategies to ensure a more sustainable future.

As the research landscape evolves, the growing body of academic work on sustainable governance and digital transformation becomes increasingly apparent. This shift is not only reflected in the increasing volume of publications but also in the changing nature of the sources contributing to the discourse. The annual scientific production chart demonstrates a sharp rise in research output, signaling an increased focus on innovative governance solutions and climate change adaptation. To

further understand this trend, it is essential to examine the most relevant sources driving this academic progress. The distribution of articles across prominent journals provides insights into the core areas of research and the journals that are shaping the future of digital governance and environmental policy.

The distribution of documents across the most relevant sources in the chart reveals important trends in the academic focus and research priorities related to sustainable governance, digital transformation, and climate change. The chart highlights that Government Information Quarterly leads the field, with the highest number of publications. This indicates its significant influence in the ongoing discourse about e-government and digital governance, which are central to transforming public administration and policy-making processes in the digital age. The prominence of this source underscores the growing recognition of digital tools and data transparency as essential elements in improving government accountability and service quality, as previously highlighted in the analysis of public service clusters.

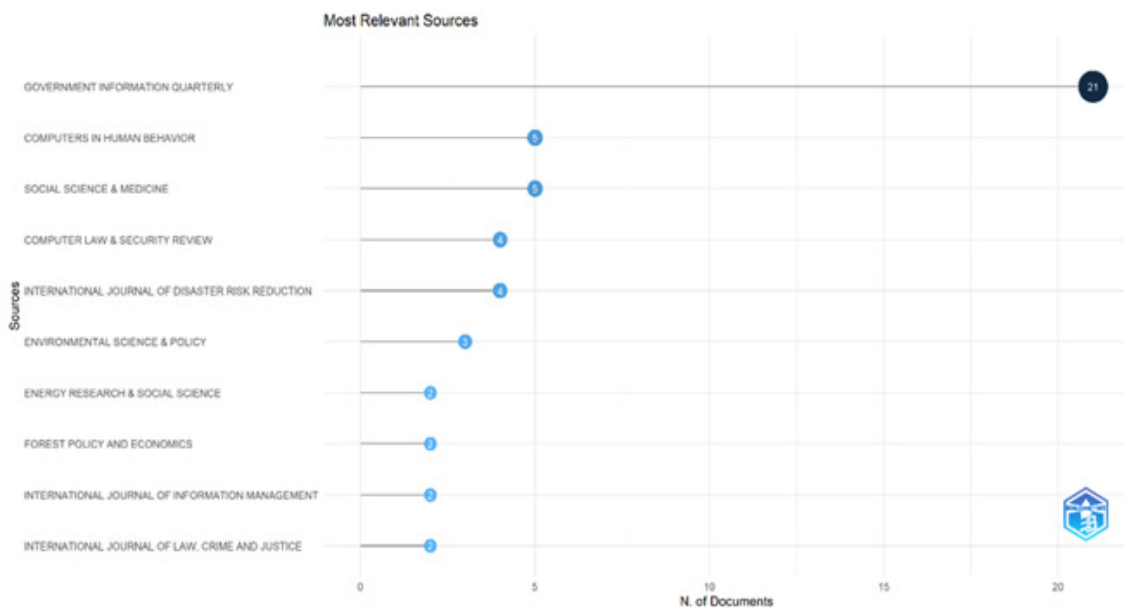


Figure 3. Relevant Sources

In addition, journals like *Computers in Human Behavior* and *Social Science & Medicine* also feature prominently in the chart, indicating a strong interdisciplinary approach in understanding the relationship between technology and human behavior. This aligns with the increasing body of research that explores how technological adoption impacts social behavior, public service delivery, and policy compliance. It reflects the broader theme of how digital transformation shapes both individual behaviors and institutional frameworks, particularly in the context of social systems and healthcare governance.

Another notable trend is the consistent presence of *Computer Law & Security Review*, *International Journal of Disaster Risk Reduction*, and *Environmental Science & Policy*. These journals demonstrate that legal frameworks and disaster risk management are gaining importance in the study of climate change and sustainable governance. Their presence suggests that policy frameworks both in terms of legal considerations and emergency preparedness are integral to understanding how governments and private sectors can respond to environmental challenges and ensure resilient infrastructure in the face of climate change. The integration of legal aspects with technological solutions

is becoming increasingly crucial for crafting policies that are both effective and sustainable.

The inclusion of *Energy Research & Social Science* and *Forest Policy and Economics* further reinforces the idea that addressing climate change and environmental governance requires collaboration between the social sciences, energy management, and resource economics. These journals highlight the intersection of energy policy, sustainable resource management, and economic implications of climate action. The sustained research output in these areas signifies the importance of developing policies that address not only environmental and technological factors but also the economic and social dimensions of climate resilience.

Overall, the distribution of research articles across these sources reflects an increasing focus on multi-sectoral and multi-disciplinary research in addressing sustainability challenges. The rise in articles from journals dealing with digital transformation, climate change, and sustainable governance confirms that the academic community is increasingly recognizing the need to integrate innovative technologies with policy frameworks to solve complex governance and environmental issues.



Figure 4. Authors' Production

Building on the rising trend in scientific production, it is essential to explore the contribution of individual authors to this growing body of research. The chart showing authors' production over time illustrates the pattern of publication across several key researchers. The chart reveals the dominant authors who have made significant contributions to the discourse on sustainable governance, digital transformation, and climate change. By examining the production rates of these authors, we can gain insights into research trends and identify the leading voices in these critical areas of study.

The analysis of the authors' production over time chart underscores a clear distinction in the contribution patterns of individual researchers. Tan Yigitcanlar TY and Alexander Paz AP stand out as the most prolific contributors, consistently publishing articles over several years. Their contributions reflect a sustained focus on key topics related to sustainable urban development, digital governance, and climate resilience. These authors have likely played a significant role in shaping the research agenda, pushing forward the conversation on integrating technology and sustainability in governance. On the other hand, the chart also shows researchers like Battulga Buyannemekh BB and Dolores E. Luna Del, who have more sporadic publication patterns. These variations in publishing frequency might suggest focused research efforts on particular themes or projects that align with global challenges such as climate adaptation or disaster risk reduction. These authors contribute to the ongoing dialogue but may not be as consistently active in the research community, which could be due to the nature of their projects or institutional constraints.

Authors such as Karl De Fine Licht KFL, Luis F. Luna-Reyes LFLR, and Rita Yi Man Li RYML have also made valuable

contributions, though their publication rates appear to be lower. This may reflect a deeper involvement in fewer but more specialized topics, potentially focusing on niche areas of digital governance or policy analysis. The noticeable rise in publications starting from 2020 aligns with the broader trend of increased research output seen globally, particularly in response to digital transformation and the urgency of addressing climate change. The chart indicates that academic interest in sustainable governance is rising sharply, as seen by the influx of articles in recent years. This trend mirrors the global shift towards smart cities, green technologies, and data-driven solutions for addressing urban and environmental challenges.

Overall, the data on authors' production over time reveals that leading researchers are driving the growth of knowledge in sustainability and digital governance. The rising trend in publications is indicative of a global commitment to understanding and addressing climate resilience, technological innovation, and public sector transformation. As more authors contribute to this rapidly expanding field, the collaborative nature of these efforts will likely continue to shape the policies and technologies that define sustainable governance in the future.

As the research on sustainable governance, digital transformation, and climate change continues to evolve, examining the key terms and their relationships within the academic literature provides deeper insights into how these fields intersect. The analysis of terms related to digital governance, public service, and environmental resilience reveals a complex web of interconnected concepts that shape the future of policy development and technological innovation. By exploring the relationships between these terms, we can gain a better understanding of how digital tools and governance frameworks are transforming the way

governments address global challenges such as climate change and public service delivery. The following analysis delves into these relationships, highlighting the significance of key terms and their clustering within the broader context of public administration and sustainable development.

The terms and clusters identified in the analysis are highly relevant to Indonesia's ongoing efforts in digital transformation and sustainable governance. The clustering of terms such as "transparency," "blockchain," "e-government," and "digitalization"

reflects the growing focus on digital tools to enhance public service delivery and ensure government accountability. In Indonesia, where bureaucratic inefficiencies and corruption have historically plagued the public sector, there is an increasing push towards digital governance as a solution. The term "blockchain", often associated with ensuring data integrity, speaks to the potential for secure, transparent systems in addressing corruption and improving public trust. As Indonesia continues its push towards digital government services,

Table 2. Data Analysis of Terms and Clusters

Word	Dim1	Dim2	Cluster
Transparency	0,11	-0,04	1
Artificial Intelligence	0,13	-0,2	1
Governance	0,12	-0,11	1
Accountability	0,12	-0,12	1
Efficiency	-2,61	-0,01	1
Blockchain	0,12	-0,16	1
Compliance	0,16	3,53	1
Corruption	0,13	-0,13	1
Digitalization	0,1	-0,09	1
E-Government	0,1	-0,09	1
India	0,11	-0,11	1
Public Sector	0	-0,1	1
Service Design	0,1	-0,09	1
Social Media	0,1	-0,09	1
Affordance	0,11	-0,12	1
Artificial Intelligence (AI)	0,11	-0,11	1
Exploratory Factor Analysis	0,11	-0,1	1
Export Control	0,09	-0,08	1
Externalization	0,09	-0,07	1
Fair Trial	0,22	-0,5	1
Feature Extraction	0,11	-0,09	1
Public Service Satisfaction	0,1	-0,08	1
Public Services	0,09	-0,08	1
Public Trust	0,13	-0,12	1
Public Values	0,11	-0,1	1
Quality	-9,83	0,17	1
Quality Incentive	-0,23	-0,09	1
Quantitative Methods in Economics and law	0,1	-0,08	1

Source: Processed Data

the role of transparency becomes even more critical, especially as the government implements digital platforms for public service delivery in sectors such as health, education, and social services.

The term “compliance”, which clusters highly with governance-related terms like “accountability”, has particular significance in Indonesia’s efforts to align its regulations with global standards on data privacy and digital security. The GDPR-like frameworks and electronic governance initiatives in Indonesia reflect a growing emphasis on the need for regulatory compliance, especially as the country adopts more digital tools to improve the efficiency of public services. These initiatives are part of the broader strategy to tackle administrative inefficiencies, promote open government, and build trust among citizens.

On the other hand, terms like “climate change adaptation” and “resilience” indicate that environmental sustainability is also taking a front seat in the Indonesian development agenda. As the country faces increasingly severe weather patterns due to climate change, terms related to climate resilience become more prominent in academic research and policy discussions. The integration of digital tools into climate change mitigation efforts is critical for Indonesia, where disaster management systems are being upgraded to data-driven technologies. These systems help in predicting, managing, and responding to natural disasters such as floods, which are increasingly frequent due to climate change.

Indonesia’s vulnerability to climate-related risks is reflected in the clustering of terms such as “environmental services,” “public services,” and “sustainable development”. As Indonesia strives to build more resilient infrastructure and implement nature-based solutions to address climate challenges, it is clear

that the future of public service delivery will be heavily reliant on the use of data-driven models. The integration of terms like “digital services” and “sustainability assessment” into the discourse points to a growing recognition that sustainable development must be underpinned by both technological innovations and community-based solutions.

In addition, terms like “public sector”, “decentralization”, and “public service motivation” align with Indonesia’s push toward greater decentralization of authority and local governance. Indonesia’s government has been promoting local empowerment and decentralization to better meet the diverse needs of its population across the archipelago. The increasing focus on public service motivation reflects an effort to enhance the efficiency and effectiveness of local governments, especially in the face of diverse challenges such as poverty alleviation and social inequality.

Overall, the clustering of these terms provides valuable insights into Indonesia’s priorities in governance, digital transformation, and climate change adaptation. The interconnectedness of these themes highlights the multidimensional approach that Indonesia is adopting to address its governance challenges. The integration of digital tools into public service delivery is essential to improving governance and resilience in the face of climate change. It also points to the growing need for collaboration between government, technology providers, and citizens in shaping a sustainable and equitable future. The findings emphasize that digital tools such as e-government, blockchain, and data transparency are not only improving public service delivery but also playing a key role in enhancing government accountability. As Indonesia continues its push for sustainable mobility and resilient infrastructure, the integration

of digital technologies in addressing climate change challenges becomes more essential. The rise of digital transformation is creating a shift in governance practices, fostering collaboration across sectors, and strengthening the framework for sustainable development. The role of multi-sector cooperation, alongside a data-driven governance model, will be pivotal for the successful implementation of sustainable policies and climate adaptation strategies in the years to come. Ultimately, Indonesia's future in achieving sustainable urban mobility and environmentally friendly development lies in the continued integration of technology, policy innovation, and public participation.

This finding extends previous studies on digital governance by showing that the value of digital technology does not lie merely in administrative efficiency, but in its capacity to reorganize governance relationships among the state, citizens, and non-state actors. Earlier studies on e-government and open government emphasize transparency and service delivery, while studies on climate governance emphasize adaptation, resilience, and collaborative action. However, the bibliometric structure identified in this study shows that these two streams of literature are increasingly converging. Digital governance is no longer limited to online public services; it is becoming a strategic instrument for managing sustainability challenges, including transportation emissions, urban resilience, and climate adaptation. This synthesis strengthens the argument that sustainable mobility in Indonesia should be understood as a digital governance agenda, not simply as a transport infrastructure agenda.

CONCLUSION

This study has highlighted the profound interconnections between digital

transformation, public governance, and climate change adaptation in Indonesia. The findings emphasize the importance of digital tools such as e-government, blockchain, and data transparency in improving public service delivery and ensuring government accountability. As Indonesia continues to address its environmental challenges, particularly in the face of rapid urbanization and climate change, the integration of innovative technologies within the public sector becomes crucial. Additionally, the development of sustainable policies through digital solutions presents an opportunity to improve resilience, mitigate climate-related risks, and create a green urban future. The introduction of smart governance and data-driven decision-making in Indonesia's national and local governments will support the country's efforts to meet its sustainability and climate adaptation goals.

Moving forward, the research suggests that further studies should focus on local-level implementation of these digital governance frameworks, particularly in addressing the challenges of bureaucratic inefficiencies and interagency coordination. Additionally, future research could explore the impact of digital tools on climate resilience at the community level, assessing how technology can better support climate adaptation strategies. Future studies could also assess the effectiveness of digital transformation initiatives in specific sectors such as transportation, energy, and public health in Indonesia, where smart solutions could optimize public services and enhance sustainability. Finally, exploring the role of public participation and inclusive governance will be critical in ensuring that digital transformation efforts are equitable, benefiting all segments of society and contributing to a more sustainable and just future for Indonesia.

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