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DIGITAL GOVERNANCE COMMUNICATION IN GAMPONG: COMMUNITY PARTICIPATION IN REALIZING ONE DATA ACEH THROUGH SIGAP

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Abstract

Village governments in Aceh Province have adopted the Gampong Information System (SIGAP) as the primary digital instrument for realizing *Satu Data Aceh* (One Data Aceh), yet studies of Indonesian village digitalization have largely examined e-governance as a technical infrastructure problem, leaving the communicative and socio-cultural dimensions of implementation underexplored. This study addresses that gap by analyzing SIGAP as a digital communication practice, focusing on the opportunities and challenges of implementation and, distinctively, on the forms and depth of community participation in validating *gampong* (village) data. Using a qualitative descriptive-analytical case study design, data were drawn from regulatory documents, scientific literature, and credible news reports, triangulated with the author's field observations as an official of the Aceh Office of Community and Gampong Empowerment (DPMG Aceh), and analyzed thematically. The findings show that SIGAP accelerates public services and strengthens administrative transparency, but its implementation is constrained by digital literacy, infrastructure gaps, data-hoax risks, and unresolved questions of data security. Read through Arnstein's Ladder of Citizen Participation, community involvement in SIGAP currently sits mostly at the informing and consultation rungs, with only isolated cases approaching genuine partnership. The study contributes a communication-centered, participation-based framework for understanding village data governance, and recommends that DPMG Aceh strengthen participatory mentoring models grounded in Acehnese customary deliberation (*musyawarah*) and the Islamic principles of *amanah* (trust and responsibility) and *tabayyun* (information verification) to move community involvement toward higher rungs of the participation ladder.

Keywords: Community Participation; Digital Communication; e-Government; SIGAP; One Data Aceh; Village Data Governance.

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Abstrak

Pemerintah gampong di Provinsi Aceh telah mengadopsi Sistem Informasi Gampong (SIGAP) sebagai instrumen digital utama untuk mewujudkan Satu Data Aceh, namun kajian tentang digitalisasi desa di Indonesia sebagian besar memandang e-governance sebagai persoalan infrastruktur teknis, sehingga dimensi komunikatif dan sosial-budaya dari implementasinya belum banyak dikaji. Penelitian ini mengisi kesenjangan tersebut dengan menganalisis SIGAP sebagai praktik komunikasi digital, dengan fokus pada peluang dan tantangan implementasinya serta, secara khusus, pada bentuk dan kedalaman partisipasi masyarakat dalam memvalidasi data gampong. Dengan desain studi kasus kualitatif deskriptif-analitis, data diperoleh dari dokumen regulasi, literatur ilmiah, dan pemberitaan media yang kredibel, yang ditriangulasi dengan pengamatan lapangan penulis sebagai pejabat Dinas Pemberdayaan Masyarakat dan Gampong (DPMG) Aceh, lalu dianalisis secara tematik. Temuan menunjukkan bahwa SIGAP mempercepat pelayanan publik dan memperkuat transparansi administrasi, tetapi implementasinya terkendala oleh literasi digital, kesenjangan infrastruktur, risiko hoaks data, serta persoalan keamanan data yang belum terselesaikan. Dibaca melalui Tangga Partisipasi Warga (Ladder of Citizen Participation) Arnstein, keterlibatan masyarakat dalam SIGAP saat ini sebagian besar berada pada anak tangga pemberian informasi dan konsultasi, dengan hanya sebagian kecil kasus yang mendekati kemitraan sejati. Penelitian ini menawarkan kerangka berpusat pada komunikasi dan berbasis partisipasi untuk memahami tata kelola data desa, serta merekomendasikan agar DPMG Aceh memperkuat model pendampingan partisipatif yang berpijak pada musyawarah adat Aceh dan prinsip Islam amanah dan tabayyun guna menggeser keterlibatan masyarakat ke anak tangga partisipasi yang lebih tinggi.

Kata Kunci: Partisipasi Masyarakat; Komunikasi Digital; e-Government; SIGAP; Satu Data Aceh; Tata Kelola Data Desa.

INTRODUCTION

The transition toward data-driven governance has become a global paradigm, and Indonesia has responded through the *Satu Data Indonesia* (One Data Indonesia) policy as the foundation for integrated and accurate development planning. Article 86 of Law No. 6 of 2014 on Villages extends this mandate to the lowest level of government: regional governments must establish village information systems that are accessible to the public.[1] The logic is simple but its consequences are substantial, because incorrect data recorded at the village level will be carried into every higher level of development planning.

Aceh has responded to this mandate through the Gampong Information System (*Sistem Informasi Gampong*, SIGAP), regulated by Aceh Governor Regulation No. 33 of 2021 and developed by the Aceh Office of Community and Gampong Empowerment (DPMG Aceh) together with the Aceh Office of Communication, Informatics, and Encryption (Diskominsa Aceh), with support from the KOMPAK program.[2] It forms part of the Integrated Aceh Information System (*Sistem Informasi Aceh Terpadu*, SIAT) established

[1]Undang-Undang Republik Indonesia Nomor 6 Tahun 2014 tentang Desa, art. 86; Peraturan Presiden Republik Indonesia Nomor 39 Tahun 2019 tentang Satu Data Indonesia.

[2]Peraturan Gubernur Aceh Nomor 33 Tahun 2021 tentang Sistem Informasi Gampong; Program KOMPAK, 'Sistem Informasi Gampong (SIGAP)', SIKOMPAK, Bappenas, https://sikompak.bappenas.go.id/storage/app/uploads/public/624/007/abd/624007abd8483665286055.pdf.

under Qanun Aceh No. 7 of 2020 and serves the 6,500 *gampong* (villages) of Aceh, which are governed under *qanun* (Aceh regional regulations).[3] In this study, the author observed that SIGAP goes far beyond administrative software: it operates as a communication channel connecting sub-districts, regencies/cities, the province, and *gampong* within one data ecosystem, while also bridging conventional deliberative traditions with the modernity of digital data. Nevertheless, only 2,752 of the 6,500 *gampong* (42.34%) had entered data as of October 2025, so more than half of Aceh's *gampong* had not yet been fully integrated into the shared data ecosystem.[4] The issue is not merely technological capacity but also the ability to communicate: how DPMG, regencies/cities, sub-districts, *geuchik* (village heads), *gampong* operators, and residents can use a common data language.

Digital communication at the *gampong* level is more complex than in urban settings. The adoption of digital systems faces inadequate infrastructure, limited digital literacy, and strong oral communication traditions grounded in customary deliberation. The international literature has shown that the digital divide is not a matter of access alone but shifts toward differences in how people use digital technologies and in the benefits they obtain from them.[5] Conversely, when implementation goes well, digital communication can accelerate public services, reduce administrative errors, and open more room for residents to take part in village development. A study by Al Bahri and colleagues in Gampong Luthu Lamweu, Aceh Besar, found that SIGAP implementation increased residents' ease of access to data by 21% and administrative transparency by 20%.[6] Studies of SIGAP in other *gampong* in Aceh Besar likewise describe how community-service students help develop and enter *gampong* data, and how operator skills remain a limiting factor.[7]

The Smart Village concept combines village governance with information and communication technology to improve services and citizen participation, and its governance pillar emphasizes smart governance as a relational and institutional process rather than merely a technical one.[8] SIGAP can be understood as an instrument of smart governance that applies this concept to the governance pillar. At the national level, the concept aligns with the One Data Indonesia policy.[9] In Aceh, it is implemented through SIGAP, which forms part of the Integrated Aceh Information System (*Sistem Informasi Aceh*

[3]Qanun Aceh Nomor 7 Tahun 2020 tentang Informasi Aceh Terpadu.

[4]'Aceh Genjot Digitalisasi Gampong, 6500 Gampong Ditargetkan Terhubung Sistem SIGAP', Bisnisia.id, 5 November 2025, https://bisnisia.id/aceh-genjot-digitalisasi-gampong-6500-gampong-ditargetkan-terhubung-sistem-sigap/; 'Aceh Genjot Digitalisasi Gampong, 6500 Gampong Ditargetkan Terhubung Sistem SIGAP', Liputan Gampong News, https://liputangampongnews.id/berita/detail/aceh-genjot-digitalisasi-gampong-6500-gampong-ditargetkan-terhubung-sistem-sigap.

[5]Alexander J. A. M. van Deursen and Jan A. G. M. van Dijk, 'The Digital Divide Shifts to Differences in Usage', *New Media & Society* 21, no. 2 (2019): 354–75, https://doi.org/10.1177/1461444818797082.

[6]Al Bahri, Safrizal Razali, Maimun Maimun, Aulia Rahman, Sayed Muchallil, and Hubbul Walidainy, 'Dampak Implementasi Sistem Informasi Gampong (SIGAP) pada Digitalisasi Administrasi Desa dalam Konsep Smart Village Initiative di Gampong Luthu Lamweu, Aceh Besar', *Jurnal JTIK (Jurnal Teknologi Informasi dan Komunikasi)* 9, no. 3 (2025): 1175–82, https://doi.org/10.35870/jtik.v9i3.3345.

[7]Arzika Putri, 'Peran Kuliah Pengabdian Masyarakat (KPM) dalam Mengembangkan Sistem Informasi Gampong (Studi di Desa Lamsiteh Kecamatan Darul Imarah Kabupaten Aceh Besar)', *Jurnal Riset dan Pengabdian Masyarakat* 4, no. 2 (2024): 92–105; Dina Hanifa, 'Penerapan Sistem Informasi Gampong (SIGAP) pada Gampong Tingkeum Kecamatan Darul Imarah Kabupaten Aceh Besar', *Jurnal Riset dan Pengabdian Masyarakat* 4, no. 1 (2024): 48–60.

[8]Albert Meijer and Manuel Pedro Rodríguez Bolívar, 'Governing the Smart City: A Review of the Literature on Smart Urban Governance', *International Review of Administrative Sciences* 82, no. 2 (2016): 392–408, https://doi.org/10.1177/0020852314564308; J. Ignacio Criado and J. Ramon Gil-Garcia, 'Creating Public Value through Smart Technologies and Strategies: From Digital Services to Artificial Intelligence and Beyond', *International Journal of Public Sector Management* 32, no. 5 (2019): 438–50.

[9]Peraturan Presiden Republik Indonesia Nomor 39 Tahun 2019 tentang Satu Data Indonesia.

Terpadu, SIAT) and digitally connects all levels of government. Therefore, e-government at the *gampong* level does not merely convert paper documents into digital files; it also reshapes the entire government communication system.

The problem is that most studies, including research on village information systems in various parts of Indonesia, assess e-government success primarily in terms of feature completeness, service speed, and quantitative data-entry achievements. This is consistent with staged e-government models that treat information technology as the main driver of bureaucratic modernization.[10] The social-process dimension of digital communication, and the role of communities as active partners in maintaining data validity, tend to receive less attention in these accounts.[11] Studies of SIGAP in individual *gampong* have typically examined service quality, operator capacity, or training outcomes.[12] However, few studies have specifically examined how local communication traditions, such as customary *musyawarah* (consultative deliberation) and the Islamic principle of *tabayyun* (information verification, grounded in Q.S. al-Ḥujurāt [49]:6), interact with digital village information systems such as SIGAP.[13]

This study seeks to address that gap. Rather than treating SIGAP merely as an information system, it frames SIGAP as a digital communication practice that brings together top-down governance obligations and bottom-up local communication wisdom. In particular, it examines the depth of community participation in validating *gampong* data, using Arnstein's Ladder of Citizen Participation as an additional analytical lens.[14] The study's novelty lies in combining government communication, Acehnese local wisdom, and Islamic information ethics (*amanah*, the responsibility to safeguard data, and *tabayyun*) within a single analytical framework for village data governance, a combination that has received limited attention in the literature on village digitalization in Indonesia.

Based on the discussion above, this study aims to: (1) explain SIGAP as a digital communication system for *gampong* in Aceh in terms of its legal basis, features, and level of implementation through 2026; (2) identify the communication opportunities and challenges that arise during SIGAP implementation, including infrastructure, literacy, culture, and data security; and (3) analyze the depth of community and government-apparatus participation in validating data for One Data Aceh, using participatory communication and Islamic perspectives on *amanah* and *tabayyun*. Theoretically, this study contributes an analytical framework combining the e-government governance model, the Ladder of Citizen Participation, and Islamic information ethics to examine village data communication. Practically, its findings are expected to inform DPMG Aceh, Diskominsa

[10]Karen Layne and Jungwoo Lee, 'Developing Fully Functional E-Government: A Four Stage Model', *Government Information Quarterly* 18, no. 2 (2001): 122–36, https://doi.org/10.1016/S0740-624X(01)00066-1; M. Jae Moon, 'The Evolution of E-Government among Municipalities: Rhetoric or Reality?', *Public Administration Review* 62, no. 4 (2002): 424–33, https://doi.org/10.1111/0033-3352.00196.

[11]Archon Fung, 'Varieties of Participation in Complex Governance', *Public Administration Review* 66, no. s1 (2006): 66–75, https://doi.org/10.1111/j.1540-6210.2006.00667.x.

[12]Raihan Wilda, Marliana Marliana, Abid Rifaldi, and Taufik Taufik, 'Pemanfaatan Sistem Informasi Gampong (SIGAP) dalam Meningkatkan Kualitas Pelayanan Publik di Gampong Ulee Tuy', *Jurnal Riset dan Pengabdian Masyarakat* 4 (2024); Agus Kurniawan and Fairus Fairus, 'Dari Tradisi ke Teknologi: Pelatihan Sistem Informasi Gampong (SIGAP) Mengubah Dinamika Administratif di Gampong Aceh', *Martabe: Jurnal Pengabdian Masyarakat*.

[13]Khaerul Asfar, Alkap Prayoga, and Hidayatullah Hidayatullah, 'Tabayyun Digital QS. Al-Hujurat Ayat 6 sebagai Etika Komunikasi Islam di Era Hoaks', *Al-Aqwam* 3, no. 2, https://doi.org/10.58194/al-aqwam.v3i2.3612; Rizal Faturohman Purnama, 'The Concept of Tabayyūn in the Qur'ān: Efforts to Address the Spread of Information on Social Media', *Jurnal At-Tibyan: Jurnal Ilmu Al-Qur'an dan Tafsir* 6, no. 1 (2021): 40–58.

[14]Sherry R. Arnstein, 'A Ladder of Citizen Participation', *Journal of the American Institute of Planners* 35, no. 4 (1969): 216–24, https://doi.org/10.1080/01944366908977225.

Aceh, and *Satu Data Indonesia* policymakers as they design more participatory communication and mentoring strategies.

METHOD

This study employs a qualitative, descriptive-analytical case-study design because its aim is to understand in depth how digital communication operates within the social and cultural context of *gampong* (villages) in Aceh, rather than to measure or generalize relationships between variables.[15] SIGAP in Aceh Province is the main case, while several *gampong* that have implemented SIGAP, namely Gampong Luthu Lamweu, Gampong Lamsiteh, Gampong Ujong Drien, Gampong Ulee Tuy, and Gampong Tingkeum, serve as comparative units of analysis to capture variations in implementation successes and challenges.

The data sources fall into three categories. First, national and provincial regulatory documents governing SIGAP and One Data Aceh, ranging from laws and presidential regulations to *qanun* (Aceh regional regulations), governor regulations, and governor instructions. Second, scholarly literature and institutional reports on village information systems and Smart Villages in various parts of Indonesia, selected according to three criteria: thematic relevance to village-government digitalization, the credibility of the publisher or issuing institution, and recency, with publications from the last five years prioritized. Third, media reports and official government releases documenting SIGAP implementation in factual terms and allowing cross-checking against other sources. Documents were treated as data to be examined and interpreted for their content, context, and the purposes for which they were produced, not as neutral records.[16]

Data were collected through document and literature reviews, then triangulated with the author's field observations and reflections while serving as an official of the Aceh Office of Community and Gampong Empowerment (DPMG Aceh) directly involved in supporting SIGAP implementation in several regencies/cities. The author's position within the organization being studied could introduce bias, and it also gives privileged access to how implementation actually proceeds, which is characteristic of insider research.[17] To minimize the risk of bias, claims derived from field experience were cross-checked against official documents, news reports, or other research findings before being used analytically, and the author deliberately distinguishes verified findings from personal, interpretive reflections. Because the study relies on documents and the author's observations rather than interviews with residents, residents' perspectives are represented only as they are reported in the sources.

The data were analyzed thematically in three stages: (1) grouping data under the broad themes of opportunities, challenges, and community participation; (2) mapping each finding onto the relevant theoretical framework; and (3) interpreting patterns across themes to formulate conclusions and recommendations.[18] The staged e-government model was used to analyze opportunities and challenges, Arnstein's Ladder of Citizen Participation to assess the depth of community involvement, and the Islamic information-ethics principles of *amanah* (the responsibility to safeguard data) and *tabayyun* (information verification) as

[15]Robert K. Yin, *Case Study Research and Applications: Design and Methods*, 6th ed. (Thousand Oaks, CA: SAGE, 2018); Robert E. Stake, *The Art of Case Study Research* (Thousand Oaks, CA: SAGE, 1995).

[16]Glenn A. Bowen, 'Document Analysis as a Qualitative Research Method', *Qualitative Research Journal* 9, no. 2 (2009): 27–40, https://doi.org/10.3316/QRJ0902027.

[17]Sonya Corbin Dwyer and Jennifer L. Buckle, 'The Space Between: On Being an Insider-Outsider in Qualitative Research', *International Journal of Qualitative Methods* 8, no. 1 (2009): 54–63, https://doi.org/10.1177/160940690900800105.

[18]Virginia Braun and Victoria Clarke, 'Using Thematic Analysis in Psychology', *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101, https://doi.org/10.1191/1478088706qp063oa.

an additional lens relevant to Aceh's context as a region implementing Islamic law.[19] The credibility of the analysis rests on triangulation across regulatory documents, scholarly sources, media reports, and field observation, so that no claim depends on a single source type.[20]

FINDINGS AND DISCUSSION

Findings

1. SIGAP as a *Gampong* Data Communication System

a. History and Legal Basis

DPMG Aceh developed SIGAP together with the Aceh Communication, Informatics, and Cryptography Office (Diskominsa Aceh), with support from the KOMPAK program.[21] SIGAP was designed to connect data across *gampong*, sub-districts, regencies/cities, and the province so that data can be used across sectors. It implements Article 86 of Law No. 6 of 2014 on Villages and forms a component of the Integrated Aceh Information System (SIAT), which aims to ensure that data are accurate, up to date, accessible through a single gateway, and serve as a shared reference for planning. Its legal basis consists of Qanun Aceh No. 7 of 2020 on Integrated Aceh Information, Aceh Governor Regulation No. 33 of 2021 on the Gampong Information System, and Governor Regulation No. 24 of 2022 on the Implementation of One Data, as amended by Governor Regulation No. 22 of 2025. On 29 September 2025, Governor Muzakir Manaf issued Governor Instruction No. 05/INSTR/2025 on the Implementation of SIGAP, which designates SIGAP as the sole official application supporting One Data Aceh and requires regents and mayors to report progress every six months and heads of provincial agencies every three months. At the national level, SIGAP is supported by Presidential Regulation No. 39 of 2019 on One Data Indonesia.[22]

b. Functions and Features

Through the sigapaceh.id portal, SIGAP offers three main groups of features: population information (numbers by religion, sex, education, disability, age, and occupation), planning and budget information that is publicly accessible, and government statistics on *gampong* officials. Studies of SIGAP in Gampong Tingkeum and Gampong Ulee Tuy, Aceh Besar, describe these features as tools for transparency and accountability, and an evaluation in Ulee Tuy using the six DeLone and McLean indicators (system quality, information quality, service quality, use, user satisfaction, and net benefits) found all six satisfactorily met, although officials requested correspondence templates and regular updates to improve data security.[23]

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[19]Richard Heeks, *Implementing and Managing eGovernment: An International Text* (London: SAGE, 2006); Layne and Lee, 'Developing Fully Functional E-Government: A Four Stage Model'; Arnstein, 'A Ladder of Citizen Participation'.

[20]Nancy Carter, Denise Bryant-Lukosius, Alba DiCenso, Jennifer Blythe, and Alan J. Neville, 'The Use of Triangulation in Qualitative Research', *Oncology Nursing Forum* 41, no. 5 (2014): 545–47, https://doi.org/10.1188/14.ONF.545-547; Yvonna S. Lincoln and Egon G. Guba, *Naturalistic Inquiry* (Newbury Park, CA: SAGE, 1985).

[21]Program KOMPAK, 'Sistem Informasi Gampong (SIGAP)'; Putri, 'Peran Kuliah Pengabdian Masyarakat (KPM) dalam Mengembangkan Sistem Informasi Gampong'.

[22]Undang-Undang Nomor 6 Tahun 2014 tentang Desa, art. 86; Qanun Aceh Nomor 7 Tahun 2020 tentang Informasi Aceh Terpadu; Peraturan Gubernur Aceh Nomor 33 Tahun 2021 tentang Sistem Informasi Gampong; Peraturan Gubernur Aceh Nomor 24 Tahun 2022 tentang Penyelenggaraan Satu Data, sebagaimana diubah dengan Peraturan Gubernur Aceh Nomor 22 Tahun 2025; Instruksi Gubernur Aceh Nomor 05/INSTR/2025 tentang Penerapan Sistem Informasi Gampong (SIGAP), 29 September 2025; Peraturan Presiden Nomor 39 Tahun 2019 tentang Satu Data Indonesia.

[23]Dina Hanifa, 'Penerapan Sistem Informasi Gampong (SIGAP) pada Gampong Tingkeum Kecamatan Darul Imarah Kabupaten Aceh Besar', *Jurnal Riset dan Pengabdian Masyarakat* 4, no. 1 (2024): 48–

c. Versions and Implementation Achievements

SIGAP development is ongoing: version 1.10.6 is the latest release listed on sigapaceh.id, and the portal operates across all 23 regencies/cities, with more than 2.3 million visits recorded. Quantitative achievements show that room for improvement remains: of the 6,500 *gampong* targeted as of October 2025, only 2,752 (42.34%) had entered data. The Head of the Aceh Regional Secretariat's Bureau of Aceh Privileges and People's Welfare therefore urged regents and mayors to ask sub-district heads and *geuchik* to optimize data entry, and coordination meetings with local governments, such as the one held in Bireuen in June 2026, continue to push implementation.[24] SIGAP's implementation rests on cooperation among DPMG Aceh, Diskominsa Aceh, and the KOMPAK program, and on the involvement of community-service students who help *gampong* develop and enter data.[25]

d. Transparency and Accountability

Residents, regency/city governments, and the provincial government can access administrative, financial, and population data entered into the system in real time, which marks a shift from *gampong* data that were previously kept in physical files and difficult for the public to see.[26] Any *gampong* may apply in writing to DPMG Aceh through its sub-district head or the local DPMG office to obtain SIGAP free of charge, and DPMG and Diskominsa maintain the system internally rather than through third-party vendors.

2. Opportunities for Digital Communication

Studies of SIGAP in individual *gampong* report faster administrative processes. In Gampong Luthu Lamweu, Aceh Besar, implementation increased administrative transparency by 20% and ease of data access by 21% in less than a year, and a study of Gampong Lamsiteh found that community-service students helped develop the system.[27] Because data are recorded once in the system, residents can resolve administrative matters, from domicile certificates to poverty data for social-assistance applications, without repeatedly visiting the *gampong* office.

On data integration, the Government of Aceh launched the One Data Aceh Portal at Anjong Mon Mata, the Aceh Governor's residence in Banda Aceh, in April 2025, as part of the Aceh Governor's 2025–2030 vision and among the Governor and Deputy Governor's quick-win programs. Australia's Department of Foreign Affairs and Trade (DFAT) has since described Aceh's One Data practices as a reference for the provincial

60; Raihan Wilda, Marliana Marliana, Abid Rifaldi, and Taufik Taufik, 'Pemanfaatan Sistem Informasi Gampong (SIGAP) dalam Meningkatkan Kualitas Pelayanan Publik di Gampong Ulee Tuy', *Jurnal Riset dan Pengabdian Masyarakat* 4 (2024).

[24]'Aceh Genjot Digitalisasi Gampong, 6500 Gampong Ditargetkan Terhubung Sistem SIGAP', Bisnisia.id; 'Dorong Integrasi Data, Pemerintah Aceh dan Bireuen Perkuat SIGAP', MEDIAACEH.CO, 10 June 2026, https://mediaaceh.co/2026/06/10/dorong-integrasi-data-pemerintah-aceh-dan-bireuen-perkuat-sigap/.

[25]Putri, 'Peran Kuliah Pengabdian Masyarakat (KPM) dalam Mengembangkan Sistem Informasi Gampong'; Hanifa, 'Penerapan Sistem Informasi Gampong (SIGAP) pada Gampong Tingkeum'.

[26]Marijn Janssen, Yannis Charalabidis, and Anneke Zuiderwijk, 'Benefits, Adoption Barriers and Myths of Open Data and Open Government', *Information Systems Management* 29, no. 4 (2012): 258–68, https://doi.org/10.1080/10580530.2012.716740.

[27]Al Bahri, Safrizal Razali, Maimun Maimun, Aulia Rahman, Sayed Muchallil, and Hubbul Walidainy, 'Dampak Implementasi Sistem Informasi Gampong (SIGAP) pada Digitalisasi Administrasi Desa dalam Konsep Smart Village Initiative di Gampong Luthu Lamweu, Aceh Besar', *Jurnal JTIK (Jurnal Teknologi Informasi dan Komunikasi)* 9, no. 3 (2025): 1175–82, https://doi.org/10.35870/jtik.v9i3.3345; Arzika Putri, 'Peran Kuliah Pengabdian Masyarakat (KPM) dalam Mengembangkan Sistem Informasi Gampong (Studi di Desa Lamsiteh Kecamatan Darul Imarah Kabupaten Aceh Besar)', *Jurnal Riset dan Pengabdian Masyarakat* 4, no. 2 (2024): 92–105.

governments of Gorontalo, Maluku, and East Nusa Tenggara.[28] SIGAP also gives residents a way to monitor *gampong* development, since budget and program data that were previously inaccessible can be tracked online.[29] Its implementation aligns with the Aceh Governor's 2025–2030 vision of digital transformation and bureaucratic reform and with the national One Data Indonesia targets.[30] Beyond administration, SIGAP's Gampong Asset Map could serve as a catalogue of local economic potential, and the author proposes extending it with an investment dashboard, tourism calendar, and product catalogue for Aceh.

3. Challenges of Digital Communication

a. Digital Literacy

Many *geuchik* (village heads) and village operators remain unfamiliar with using computers or smartphones for administrative tasks, a pattern that international research treats as a gap in digital skills and use rather than in access alone.[31] The problem is compounded by frequent turnover among *gampong* officials following village-head elections, which requires training to be repeated. Training on SIGAP in Aceh has been documented as a way of introducing the application and strengthening local skills in using information technology, and the author's field experience suggests that a tiered and continuous mentoring model involving permanent officials, *gampong* operators, and student mentors is needed rather than one-off training. Interventions of this scale, however, remain small compared with the needs of all 6,500 *gampong*.[32]

b. Data Discrepancies

A recurring technical challenge is the mismatch between actual field conditions and civil registration records such as identity cards (KTP), family cards (KK), and Civil Registration Office (Dukcapil) data: residents who moved without updating records, unreported deaths, and unregistered seasonal residents create recurring errors. Without accurate data, the risk of misdirected social assistance and development planning remains high, and synchronization among Dukcapil, the village information system, BPJS (the national health insurance agency), and the Social Affairs Office is slowed by sectoral silos.[33]

c. Infrastructure

Remote areas in the Gayo Lues highlands, the interior of Southeast Aceh, and outer islands such as Simeulue face weak signals and limited connectivity. Because SIGAP is a web-based application, these connectivity gaps directly constrain data entry and the

[28]Mulia Megantari, 'Semangat Kolaborasi untuk Tata Kelola Pemerintah: Peluncuran Portal Satu Data Aceh sebagai Langkah Strategis Pemerintah Daerah', data.go.id, 30 April 2025, https://data.go.id/news/2025/04/semangat-kolaborasi-untuk-tata-kelola-pemerintah-peluncuran-portal-satu-data-aceh-sebagai-langkah-strategis-pemerintah-daerah/820; 'DFAT Australia Nilai Aceh Selangkah Lebih Maju dalam Tata Kelola Data', InfoPublik, https://infopublik.id/kategori/nusantara/983367/dfat-australia-nilai-aceh-selangkah-lebih-maju-dalam-tata-kelola-data.

[29]Janssen, Charalabidis, and Zuiderwijk, 'Benefits, Adoption Barriers and Myths of Open Data and Open Government'.

[30]Megantari, 'Semangat Kolaborasi untuk Tata Kelola Pemerintah'; 'Dorong Integrasi Data, Pemerintah Aceh dan Bireuen Perkuat SIGAP', MEDIAACEH.CO.

[31]Alexander J. A. M. van Deursen and Jan A. G. M. van Dijk, 'The Digital Divide Shifts to Differences in Usage', *New Media & Society* 21, no. 2 (2019): 354–75, https://doi.org/10.1177/1461444818797082.

[32]Agus Kurniawan and Fairus Fairus, 'Dari Tradisi ke Teknologi: Pelatihan Sistem Informasi Gampong (SIGAP) Mengubah Dinamika Administratif di Gampong Aceh', *Martabe: Jurnal Pengabdian Kepada Masyarakat* 7, no. 3 (2024): 955–61, https://doi.org/10.31604/jpm.v7i3.955-961; author's field observation as an official of DPMG Aceh.

[33]Hanifa, 'Penerapan Sistem Informasi Gampong (SIGAP) pada Gampong Tingkeum'.

validation of residents' records, which can widen the gap between *gampong* that are well connected and those that are not.[34]

d. Hoaxes and Disinformation

False information about government programs, Village Fund policies, or social-assistance data circulates through WhatsApp groups and social media faster than official information from SIGAP, and village officials themselves sometimes spread it because they lack the skills to verify information through *tabayyun* (information verification). This makes verification against the primary source an ethical as well as a technical requirement.[35]

e. Cultural Resistance

Acehnese communities have a strong tradition of communication through customary deliberation in *kenduri* (communal feasts), *meunasah* (local prayer and community halls), and *gampong* customary councils. A study of SIGAP training in Aceh titled "From Tradition to Technology" describes the dialectic between the two, and the practical implication is that SIGAP outreach should take place through the *meunasah*, involve the *imum* (religious leader), and use the Acehnese language where appropriate.[36]

f. *Data Security and Privacy.*

SIGAP stores sensitive data such as national identity numbers (NIK), addresses, socio-economic status, and disability status, which could be used for fraud, misuse of assistance, or harm to vulnerable groups if leaked. The Ulee Tuy evaluation recommends regular updates to ensure the security of stored data, and implementing Law No. 27 of 2022 on Personal Data Protection at the *gampong* level remains a major task for DPMG and Diskominsa Aceh.[37]

4. The Community's Role in Validating and Verifying *Gampong* Data

Residents can verify their population data through SIGAP and report discrepancies directly to *gampong* operators. DPMG Aceh communicates *gampong* empowerment policy to *gampong* officials across the 23 regencies/cities through policy outreach, technical training, and ongoing mentoring, as in the July 2025 training for 30 Banda Aceh operators.[38] Residents can view data and report discrepancies, but officials retain the authority to decide which data are accepted as valid and how they are used. In a few cases, such as *gampong* development-planning forums that use SIGAP's open data to set priorities, or residents verifying their own population records through *gampong* operators, involvement goes further, although final control over the data remains with government.

[34]Author's field observation as an official of DPMG Aceh; Dina Hanifa, 'Penerapan Sistem Informasi Gampong (SIGAP) pada Gampong Tingkeum Kecamatan Darul Imarah Kabupaten Aceh Besar', *Jurnal Riset dan Pengabdian Masyarakat* 4, no. 1 (2024): 48–60.

[35]Rizal Faturohman Purnama, 'The Concept of Tabayyūn in the Qur'ān: Efforts to Address the Spread of Information on Social Media', *Jurnal At-Tibyan: Jurnal Ilmu Al-Qur'an dan Tafsir* 6, no. 1 (2021): 40–58; Khaerul Asfar, Alkap Prayoga, and Hidayatullah Hidayatullah, 'Tabayyun Digital QS. Al-Hujurat Ayat 6 sebagai Etika Komunikasi Islam di Era Hoaks', *Al-Aqwam* 3, no. 2, https://doi.org/10.58194/al-aqwam.v3i2.3612.

[36]Kurniawan and Fairus, 'Dari Tradisi ke Teknologi'.

[37]Undang-Undang Nomor 27 Tahun 2022 tentang Pelindungan Data Pribadi; Wilda, Marliana, Rifaldi, and Taufik, 'Pemanfaatan Sistem Informasi Gampong (SIGAP) dalam Meningkatkan Kualitas Pelayanan Publik di Gampong Ulee Tuy'.

[38]DPMG Banda Aceh, '30 Operator Gampong dalam Kota Banda Aceh Ikuti Pelatihan SIGAP di Aula DPMG Aceh'.

Discussion

1. Opportunities through the Lens of E-Governance

The achievements above, namely faster services, data integration, information openness, policy alignment, and economic opportunities, are consistent with staged e-government models that treat information technology as a driver of bureaucratic modernization.[39] Read through such models, SIGAP serves as a bridge between local data and One Data Indonesia standards and shows that digital decentralization can reduce inter-agency data fragmentation when it is managed in an integrated way. These models also carry a caution: evidence from local e-government elsewhere suggests that technology often brings incremental rather than transformative change.[40] The finding that fewer than half of *gampong* had entered data is a reminder that formal adoption and substantive transformation are not the same thing.

Government communication in the digital era requires a shift from one-way, top-down communication toward a participatory, two-way model. Under Law No. 14 of 2008 on Public Information Disclosure, every public body, including *gampong* governments, must provide information that the public can access, and SIGAP is a practical tool for meeting that mandate at the *gampong* level.[41] Open government data can also bring benefits such as transparency and participation, but those benefits depend on users being able to find, understand, and use the data.[42] Compared with many provinces, Aceh has a relatively comprehensive legal basis consisting of three layers (*qanun*, governor regulations, and governor instructions), but a legal basis does not by itself ensure that officials adopt the system.

Rogers' Diffusion of Innovations framework helps explain the gap between legal mandate and use. Innovation spreads through knowledge, persuasion, decision, implementation, and confirmation stages, and many *gampong* may know about SIGAP without progressing to decision or implementation.[43] The Technology Acceptance Model, which emphasizes perceived usefulness and ease of use, points the same way: the Ulee Tuy findings that officials valued SIGAP because it simplified data collection, but wanted correspondence templates to increase its usefulness, show that adoption depends on concrete use cases rather than written instructions alone.[44] DPMG's communication should therefore demonstrate use and make the user experience accessible to officials without technical backgrounds.

2. Challenges through the Lens of the Digital Divide and Information Ethics

The challenges described above show that the digital divide in Aceh's *gampong* is layered. It involves unequal infrastructure access, and also gaps in literacy, trust, and

[39]Richard Heeks, *Implementing and Managing eGovernment: An International Text* (London: SAGE, 2006); Layne and Lee, 'Developing Fully Functional E-Government: A Four Stage Model'; Moon, 'The Evolution of E-Government among Municipalities: Rhetoric or Reality?'.

[40]Donald F. Norris and Christopher G. Reddick, 'Local E-Government in the United States: Transformation or Incremental Change?', *Public Administration Review* 73, no. 1 (2013): 165–75, https://doi.org/10.1111/j.1540-6210.2012.02647.x.

[41]Undang-Undang Nomor 14 Tahun 2008 tentang Keterbukaan Informasi Publik.

[42]Janssen, Charalabidis, and Zuiderwijk, 'Benefits, Adoption Barriers and Myths of Open Data and Open Government'.

[43]Everett M. Rogers, *Diffusion of Innovations*, 5th ed. (New York: Free Press, 2003).

[44]Fred D. Davis, 'Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology', *MIS Quarterly* 13, no. 3 (1989): 319–40, https://doi.org/10.2307/249008; William H. DeLone and Ephraim R. McLean, 'The DeLone and McLean Model of Information Systems Success: A Ten-Year Update', *Journal of Management Information Systems* 19, no. 4 (2003): 9–30, https://doi.org/10.1080/07421222.2003.11045748; Wilda, Marliana, Rifaldi, and Taufik, 'Pemanfaatan Sistem Informasi Gampong (SIGAP) dalam Meningkatkan Kualitas Pelayanan Publik di Gampong Ulee Tuy'

communication culture.[45] Such a multidimensional divide cannot be addressed solely by procuring hardware, since training without equipment and equipment without training are equally ineffective. The divide also affects the data themselves: where connectivity and skills are weak, data entry is slow and data accuracy suffers, which can widen inequality between connected and unconnected *gampong*.[46]

Islamic information-ethics values offer a normative response. Qur'an 49:6 instructs believers to verify news carefully when it is brought by an unreliable person, and in *gampong* data digitalization *tabayyun* is especially relevant because fair and well-targeted development planning depends on the honesty and accuracy of data.[47] Qur'an 4:58 commands that trusts (*amanah*) be delivered to those entitled to receive them, which in the SIGAP context carries three responsibilities: officials are responsible for entering data, residents for reporting changes, and regional governments for using the data to develop fair policies. From the perspective of Islamic Communication and Broadcasting, a digital system such as SIGAP can be regarded as a modern means of *da'wah* (Islamic outreach), and *da'wah bil-hal* (*da'wah* through concrete action) occurs when government and residents work together to ensure that data entered into the system are honest, accurate, and beneficial to the public good.

3. Community Participation through the Lens of Participatory Communication

Viewed through Arnstein's Ladder of Citizen Participation, the forms of community involvement identified in the findings mostly remain at the informing and consultation rungs: residents can view data and report discrepancies, but officials retain authority over which data are valid. Only in certain cases does participation begin to approach the partnership rung, even though final control remains with the government.[48] This pattern is typical of participation in complex governance, where the form and depth of participation depend on who is included, how they take part, and how far discussion is connected to authority.[49]

The participatory rural appraisal approach developed by Chambers offers a way to move participation to higher rungs: residents should not serve merely as data sources or final reviewers, but should be involved from the planning stage of data collection.[50] In Aceh, customary deliberation forums such as the *kenduri*, *meunasah*, and *gampong* customary councils already provide established institutional spaces for meaningful participation, provided SIGAP is positioned as a complement rather than a replacement for them. *Tabayyun* frames information verification as a collective responsibility rather than merely an administrative task, which opens theological and practical space for residents to play a more active role than that of passive reporters.

CONCLUSION

This study shows that the Gampong Information System (SIGAP) is available across all 23 regencies/cities, 290 sub-districts, and 6,500 *gampong* (villages) in Aceh, and that where it is used it accelerates public services and strengthens the transparency of *gampong* administration. Nevertheless, only 2,752 *gampong* (42.34%) had entered data as of October

[45]Mark Warschauer, *Technology and Social Inclusion: Rethinking the Digital Divide* (Cambridge, MA: MIT Press, 2003); van Deursen and van Dijk, 'The Digital Divide Shifts to Differences in Usage'.

[46]Meijer and Rodríguez Bolívar, 'Governing the Smart City'.

[47]Khaerul Asfar, Alkap Prayoga, and Hidayatullah Hidayatullah, 'Tabayyun Digital QS. Al-Hujurat Ayat 6 sebagai Etika Komunikasi Islam di Era Hoaks', *Al-Aqwam* 3, no. 2, https://doi.org/10.58194/al-aqwam.v3i2.3612; Purnama, 'The Concept of Tabayyūn in the Qur'ān'.

[48]Arnstein, 'A Ladder of Citizen Participation'.

[49]Fung, 'Varieties of Participation in Complex Governance'.

[50]Robert Chambers, 'The Origins and Practice of Participatory Rural Appraisal', *World Development* 22, no. 7 (1994): 953–69, https://doi.org/10.1016/0305-750X(94)90141-4.

2025, and implementation continues to face digital-literacy gaps, infrastructure limitations, hoax risks, cultural resistance, and unresolved data-security concerns. The study's novelty lies in understanding SIGAP not merely as an information system but as a digital communication practice whose success depends on the depth of citizen participation, not solely on the completeness of technical features. Read through Arnstein's Ladder of Citizen Participation, community participation in SIGAP largely remains at the informing and consultation levels and has not yet reached equal partnership between residents and government. This enriches the literature on digital village governance in Indonesia, which has tended to emphasize infrastructure and institutional readiness rather than the quality of citizen participation.

Theoretically, the study indicates that staged e-government models should be complemented by participation and local information-ethics perspectives to fully understand the success of village digitalization, especially in regions with strong customary communication traditions such as Aceh. In practical terms, the author recommends three steps for DPMG Aceh and Diskominsa Aceh: first, develop a tiered and continuous mentoring model involving permanent officials, *gampong* operators, and student mentors rather than relying on one-off training; second, integrate customary deliberation forums, namely the *meunasah* (community hall) and *gampong* customary councils, into the official SIGAP data-verification mechanism so that residents become verification partners rather than mere reporters; and third, establish explicit data-security standards as part of the One Data Aceh policy, in line with the Personal Data Protection Law.

These conclusions are bounded by the study's design. They rest on regulatory documents, scholarly literature, media reports, and the author's field observations as a DPMG Aceh official, not on interviews with residents, so residents' perspectives are represented only as reported in the sources. Future research should interview residents, *geuchik* (village heads), and operators directly, compare *gampong* that have and have not entered data, and measure participation more systematically to test whether the informing-and-consultation pattern identified here holds across Aceh.

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