

# Transformational school leadership in wetland environments: Prospects for Indonesian education

Muhammad Andri Setiawan<sup>1</sup>, Aslamiah<sup>1</sup>

<sup>1</sup>Universitas Lambung Mangkurat, Jl. Brigjen H. Hasan Basri, Banjarmasin, 70123, Indonesia

\*Corresponding author, email: andri.bk@ulm.ac.id

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## Abstract

This study aims to analyze and map the characteristics of school leadership in wetland environments and to evaluate the prospects for implementing an ecological-social leadership model in Indonesia, particularly in South Kalimantan province. Using a systematic-descriptive literature review, the research synthesized twenty peer-reviewed articles published between 2019 and 2025 that examined school leadership practices in ecologically extreme regions across Asia, Africa, and South America. The data were collected through a structured matrix and analyzed thematically to identify patterns of leadership adaptation in flood-prone and geographically isolated contexts. The results show that effective school leadership in wetland environments requires a multidimensional capacity that integrates transformational, instructional, and sustainable-ecological leadership. Transformational leadership strengthens teacher motivation and collective vision; instructional leadership enhances teaching quality and contextual learning; while sustainable leadership ensures school resilience through ecological awareness and community collaboration. The findings further indicate that leadership effectiveness is influenced by internal factors, such as competence, adaptability, and communication, and external factors, including policy support, organizational culture, and local wisdom. The study concludes that an ecological-social leadership framework, grounded in Banjar cultural values such as *gawi sabumi* (collective cooperation) and environmental stewardship, provides a viable model for improving educational leadership in wetland-based schools. This integrative model bridges global leadership theory with Indonesia's socio-ecological realities, contributing to the pursuit of resilient, equitable, and sustainable education. Future research is recommended to validate this framework through empirical studies and policy implementation in other ecologically vulnerable regions.

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## 1. Introduction

School leadership constitutes a fundamental pillar of educational administration that shapes the direction, quality, and adaptability of educational institutions in responding to social, cultural, and ecological change. Conceptually, the role of the school principal extends beyond administrative management to include instructional leadership, cultural transformation, and social change agency oriented toward educational improvement (Tran et al., 2023). Contemporary leadership theories, such as transformational, instructional, sustainable, and adaptive leadership, emphasize the integration of vision, values, and participatory governance as central mechanisms for effective school management in diverse contexts (Abdul Rahim et al., 2023; Hassan et al., 2022). Within this framework, leadership is positioned at the core of planning, organizing, implementing, and supervising all school resources.

Despite this conceptual clarity, the application of these leadership ideals encounters significant challenges in geographically and ecologically extreme settings, particularly wetland regions. In Indonesia, especially in South Kalimantan province, many schools operate in swampy and riverine environments characterized by seasonal flooding, limited infrastructure, and reliance on river-based transportation. The major flood event in 2021, one of the most severe in recent history, disrupted educational access for extended periods



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and affected more than 200,000 residents along the Barito River (Hayati et al., 2023). Such environmental disruptions impose complex administrative demands that require leadership capacities extending beyond conventional managerial approaches (Warni et al., 2020; Matori & Arifianto, 2022).

These challenges are not merely physical or logistical but reflect deeper structural issues within the educational system. Persistent disparities between urban and rural schools in Kalimantan have produced substantial educational inequalities (Rahmadi et al., 2010). Empirical evidence from border areas between West Kalimantan and Malaysia shows that some communities choose to enroll their children in neighboring countries due to superior educational facilities (Mawar & Tuti, 2018). These patterns illustrate how ecological and geographical contexts directly shape the effectiveness of educational administration, particularly school leadership in high-risk environments. Consequently, leadership approaches that focus solely on efficiency are insufficient without sensitivity to environmental, social, and cultural dimensions (Eze & Okoro, 2023; Owan, 2019).

International research offers important insights into leadership practices within ecologically vulnerable contexts. Studies in Vietnam demonstrate that transformational leadership strengthens teacher commitment and organizational loyalty (Tran et al., 2023), while digital self-training initiatives among principals in the Mekong Delta enhance professional adaptability (Hai, 2025). In Malaysia, instructional leadership has been shown to improve learning effectiveness in rural schools despite limited resources (Fred & Singh, 2021), and sustainable leadership practices correlate strongly with positive school climates (Abdul Rahim et al., 2023). Research in Nigeria further highlights the importance of community-based communication and supervision in flood-prone regions (Magnus et al., 2019; Owan, 2019).

Additional evidence from South and Southeast Asia reinforces the importance of adaptive and disaster-resilient leadership. Studies in the Philippines and Bangladesh show that principals who effectively manage risk and ensure educational continuity during natural disasters play a critical role in safeguarding learning processes and student well-being (Cresencio & Yabut, 2023; Hamid & Hasan, 2025; Escasinas & Padro, 2024; Tejada & Chieng, 2024). In Ghana, transformational leadership contributes to improved school climate and teacher retention through motivation and collaboration (Abdulai, 2025), while research in Peru demonstrates that job satisfaction and gratitude mediate leadership effects on organizational loyalty (Muguerza-Florián et al., 2025). Comparable findings from coastal schools in England indicate the necessity of collaborative leadership to ensure educational equity in disadvantaged regions (Passy & Ovenden-Hope, 2019).

Collectively, these studies suggest that leadership effectiveness in ecologically vulnerable settings requires the alignment of motivational, instructional, and adaptive capacities. However, the literature also indicates the absence of a leadership framework that is explicitly formulated for wetland-based educational systems in Indonesia, where schooling operates within hydrological, socio-cultural, and community-dependent ecosystems. Existing studies predominantly treat transformational, instructional, or sustainable leadership as discrete models, without systematic integration aligned with wetland ecology and indigenous cultural structures. Moreover, cross-national findings have not yet been synthesized into an analytically transferable framework suitable for Indonesia's riverine and floodplain contexts (Abdul Rahim et al., 2023; Abdulai, 2025; Azmi et al., 2018; Bronfenbrenner, 2009).

In the Indonesian context, efforts to integrate cultural and ecological values into educational practice are supported by reform movements emphasizing holistic-integrative curricula (Hamami & Nuryana, 2022). Building on this foundation, the present study introduces the concept of ecological-social leadership, which extends established leadership models, transformational, instructional, and sustainable, into a socio-ecological construct grounded in wetland ecosystems and local cultural governance. Rather than situating leadership solely within institutional hierarchies, this framework conceptualizes school leadership as environmental and social stewardship embedded within hydrological

conditions, community livelihoods, and cultural logics such as *gawi sabumi* (communal cooperation) (Hafizi et al., 2025; Bronfenbrenner, 2009; Marzano et al., 2005; Rokhman et al., 2024).

Accordingly, the central problem addressed in this study concerns the extent to which universal leadership theories can be adapted to the geographically specific and ecologically complex realities of Indonesia's wetlands. Adaptive leadership is widely recognized as critical in environments characterized by ecological uncertainty and cultural specificity, as evidenced in participatory wetland governance systems (Dawson et al., 2021). This study focuses on identifying the characteristics of effective school leadership in wetland environments, examining the ecological, social, and cultural factors that shape leadership effectiveness, and assessing the applicability of an ecological-social leadership model within Indonesia's educational administration, particularly in South Kalimantan province (Setiawan et al., 2026; Ekayani et al., 2023; Rokhman et al., 2024).

The purpose of this article is therefore to analyze and map leadership characteristics in wetland-based educational settings and to evaluate the prospects for implementing an ecological-social leadership framework within Indonesia's education system. Prior research demonstrates that integrative approaches combining social, ecological, and educational dimensions foster sustainable and adaptive learning communities (Hamami & Nuryana, 2022; Fadlillah, 2019). Through a systematic literature review, this study seeks to connect universal leadership theory with local ecological realities, offering a contextually grounded model that supports resilient, equitable, and sustainable education in regions vulnerable to hydrological disasters (Fauzi et al., 2023).

## 2. Method

This study employed a systematic literature review design guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to identify, screen, evaluate, and synthesize empirical studies on school leadership in wetland environments and its prospects for implementation in Indonesia. The adoption of a PRISMA-guided approach was aligned with the study's objective to bridge universal leadership theory with context-specific ecological realities, ensuring transparency, methodological rigor, and replicability through explicit documentation of search strategies, eligibility criteria, and study selection stages. Consistent with systematic review principles, the study emphasized structured identification and evidence synthesis rather than narrative description alone (Jesson et al., 2011). Although narrative interpretation was employed to contextualize findings within socio-ecological settings, all stages of literature identification, screening, eligibility assessment, and inclusion followed predefined and auditable criteria in accordance with PRISMA reporting standards (Ridley, 2012; Machi & McEvoy, 2016).

The corpus of studies reviewed comprised 20 peer-reviewed scientific articles published between 2019 and 2025 that examined school leadership practices in ecologically extreme or environmentally vulnerable regions. This temporal range was selected to capture contemporary leadership responses to increasing ecological uncertainty and post-disaster educational challenges. Literature was retrieved from internationally recognized academic databases, including Scopus, Elsevier, Taylor & Francis, Wiley Online Library, PubMed, DOAJ, and Google Scholar, as well as relevant open-access education journals such as *IJERE*, *AJUE*, and *JEELR*. In line with PRISMA recommendations, inclusion and exclusion criteria were established prior to screening. Studies were included if they empirically addressed school leadership, educational management, or community-based leadership within ecological, wetland, coastal, riverine, or flood-prone contexts. Studies were excluded if they lacked empirical grounding, focused exclusively on urban settings without ecological considerations, or were published before 2019, thereby ensuring both methodological relevance and contextual comparability.

**Table 1. Systematic Tracking of Literature Review**

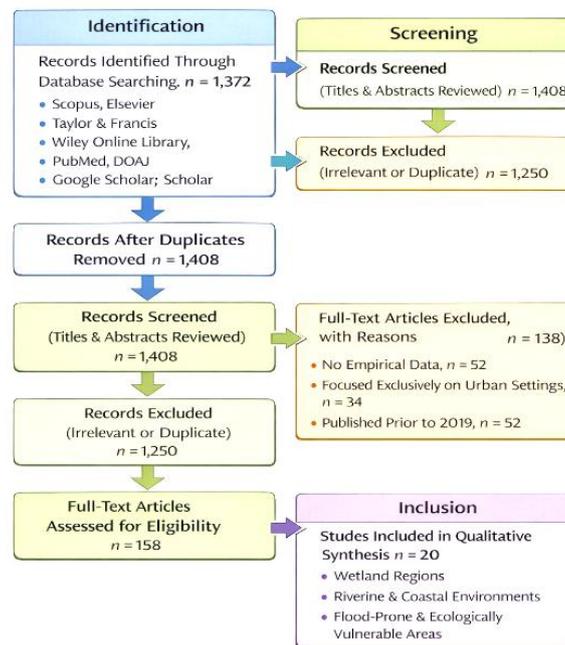
No	Search Period	Database	Publication Range	Keywords	Total Hits	Selected Articles
1	1–7 Oct 2025	Google Scholar	2019–2025	“school leadership” + “wetlands” + “education”	415	12
2	5–10 Oct 2025	Scopus (Elsevier)	2019–2025	“transformational leadership” + “ecological education”	238	6
3	8–13 Oct 2025	Taylor & Francis	2019–2025	“adaptive leadership” + “coastal schools”	152	3
4	10–17 Oct 2025	SpringerLink	2019–2025	“instructional leadership” + “rural schools”	210	5
5	15–22 Oct 2025	DOAJ & ResearchGate	2019–2025	“sustainable leadership” + “school climate”	175	4
6	20–27 Oct 2025	Wiley Online Library	2019–2025	“community leadership” + “river-based education”	120	2
7	1–8 Nov 2025	ERIC	2019–2025	“educational management” + “wetlands”	98	3
Total					1,408	20

A systematic tracking matrix functioned as the primary instrument for data extraction, enabling structured documentation of bibliographic information, research design, leadership orientation, ecological context, and thematic relevance for each study. Following PRISMA procedures, data collection progressed through four sequential stages: identification, screening, eligibility assessment, and final inclusion. During the identification stage, predefined keywords, such as “school leadership,” “educational management,” “principal leadership,” “wetland education,” “ecological leadership,” “transformational leadership,” and “adaptive leadership”, were applied consistently across selected databases. Searches conducted between October and November 2025 yielded 1,408 initial records. The screening stage involved title and abstract review to remove duplicates and clearly irrelevant studies, reducing the dataset to 158 records. Subsequent full-text eligibility assessment resulted in a final selection of 20 studies that met all inclusion criteria. This stepwise process reflects PRISMA flow logic and is summarized numerically in Table 1 to ensure procedural transparency.

Data extraction and synthesis were conducted through qualitative document analysis, with each included study examined for conceptual clarity, methodological transparency, and contextual relevance to wetland-based education systems. In accordance with PRISMA guidance on study appraisal, quality assessment employed a qualitative–interpretative framework encompassing three dimensions: conceptual quality (clarity of research focus and theoretical grounding), methodological quality (appropriateness and transparency of research procedures), and contextual relevance (applicability to ecologically vulnerable educational environments). This evaluative approach was informed by the leadership effectiveness framework proposed by Marzano et al. (2005), which conceptualizes leadership outcomes as the interaction between leadership behavior, organizational conditions, and broader socio-ecological contexts.

Data analysis followed a structured synthesis procedure consistent with PRISMA recommendations for qualitative systematic reviews. First, thematic categorization grouped studies according to dominant leadership orientations, including transformational, instructional, sustainable, and adaptive leadership. Second, narrative synthesis integrated cross-national findings to identify recurring patterns and context-specific variations relevant to Indonesia’s wetland regions. Third, argumentative synthesis connected empirical findings with established leadership and ecological theories through reflective interpretation. Finally, conceptual synthesis distilled core principles of ecological–social leadership applicable to wetland-based education systems. Throughout the reporting process, tables and figures were positioned and formatted in accordance with journal visual

standards, ensuring clarity and consistency in presentation. Figure 1 illustrates an example of adequate-resolution imagery suitable for both digital and print publication.



**Figure 1. Figure with Sufficient Resolution**

The integration of a PRISMA-guided search strategy, explicit eligibility criteria, structured quality appraisal, and transparent synthesis procedures ensures that this systematic review meets international standards for rigor and reproducibility. This methodological alignment provides a robust foundation for examining leadership practices in ecologically complex educational settings and supports the validity of the resulting conceptual framework in assessing the prospects for developing an ecological–social school leadership model within Indonesia’s wetland context.

### 3. Results

The results of this systematic literature review are derived from the analysis of 20 peer-reviewed studies published between 2019 and 2025 that examine school leadership practices in ecologically extreme or environmentally vulnerable contexts, including wetlands, riverbanks, floodplains, and coastal regions. The reviewed studies originate from multiple geographical settings, namely Southeast Asia, South Asia, Africa, South America, and Europe, and represent a range of ecological conditions such as seasonal flooding, coastal exposure, hydrological isolation, and disaster-prone environments.

Based on thematic mapping of the reviewed literature, three dominant leadership patterns were identified across the selected studies: (1) transformational–instructional leadership, (2) sustainable and disaster-resilient leadership, and (3) ecological–social and culturally grounded leadership. These patterns emerged consistently from empirical findings reported in the reviewed articles and were identified through repeated leadership constructs, focal practices, and contextual emphases documented by the authors..

#### 3.1. Transformational–Instructional Leadership

Several studies reported leadership practices that combine transformational and instructional orientations in ecologically constrained educational settings. Empirical evidence from Vietnam, Malaysia, Peru, and Ghana documented leadership practices focused on vision articulation, teacher motivation, instructional supervision, and

professional support. Fred and Singh (2021) reported that instructional leadership practices in under-enrolled rural schools in Malaysia were associated with improved teacher supervision and pedagogical consistency. Tran et al. (2023) documented transformational leadership practices in Vietnamese high schools, highlighting leadership behaviors related to vision communication and recognition of teacher contributions. Studies conducted in Peru and Ghana similarly reported leadership practices emphasizing motivation, collaboration, and teacher retention within resource-limited and rural contexts (Muguerza-Florián et al., 2025; Abdulai, 2025).

### 3.2. Sustainable and Disaster-Resilient Leadership

A second group of studies focused on leadership practices related to sustainability, disaster preparedness, and educational continuity in flood-prone and disaster-affected regions. Empirical findings from the Mekong Delta, Bangladesh, Nigeria, and Brazil documented leadership roles associated with risk management, crisis coordination, and adaptive planning.

Hai (2025) reported that school principals in the Mekong Delta engaged in continuous digital and self-directed professional development to manage environmental and technological disruptions. Hamid and Hasan (2025) described leadership practices in flood-affected regions of Bangladesh involving emergency learning coordination and flexible academic arrangements. Eze and Okoro (2023) identified principals' management of environmental hazards in Nigeria as involving collaboration with local communities and proactive facility management. Roman et al. (2021) documented leadership practices in Brazil's Pantanal that integrated hydrological conditions and local ecological knowledge into school planning.

### 3.3. Ecological–Social and Culturally Grounded Leadership

A third leadership pattern identified in the reviewed literature concerns leadership practices embedded in ecological awareness, cultural values, and community engagement. Studies from the Amazon region and the Philippines highlighted leadership roles that connect formal schooling with local knowledge systems and community life.

Virtanen (2022) reported leadership practices in Amazonian education systems that incorporated relational epistemology and environmental engagement into learning activities. Uy et al. (2024) and Tejada and Chieng (2024) documented leadership practices in rural Philippine schools characterized by community collaboration, participatory management, and cultural adaptability. These studies described principals functioning within community-based governance structures and interacting with local stakeholders in educational decision-making.

### 3.4. Cross-National Distribution of Leadership Findings

The distribution of leadership patterns across countries and ecological contexts is summarized in Table 2. The table presents the country of study, leadership focus reported, and key empirical findings documented in each article, without interpretative extrapolation.

**Table 2. Summary of Cross-National Research Findings and Application Prospects In South Kalimantan province**

No	Country	Leadership Focus	Main Findings	Application in South Kalimantan province
1	Vietnam	Transformational Leadership	Enhances teacher commitment and organizational loyalty (Tran et al., 2023)	Integrate Banjar values and participatory leadership training.

No	Country	Leadership Focus	Main Findings	Application in South Kalimantan province
2	Vietnam	Digital Self-Training Leadership	Improves principal adaptability and competence (Vo Van Be Hai, 2025)	Develop digital professional learning systems for wetland principals.
3	Malaysia	Instructional Leadership	Improves pedagogy and teacher supervision (Fred & Singh, 2021)	Contextualize instructional supervision for river-based schools.
4	Malaysia	Sustainable Leadership	Positively correlated with school climate (Abdul Rahim et al., 2023)	Implement sustainability-driven school programs.
5	Nigeria	Disaster Leadership	Enhances preparedness and community coordination (Eze & Okoro, 2023)	Strengthen environmental risk management capacity.
6	Brazil	Ecological Leadership	Integrates water-based education and culture (Roman et al., 2021)	Combine local hydrological knowledge with school governance.
7	Peru	Transformational Leadership	Increases job satisfaction and gratitude (Muguerza-Florián et al., 2025)	Encourage intrinsic motivation and teacher appreciation.
8	Philippines	Community Leadership	Enhances school-community cooperation (Uy et al., 2024)	Establish participatory leadership councils.
9	Ghana	Transformational Leadership	Boosts collaboration and teacher retention (Abdulai, 2025)	Promote cooperative leadership among rural schools.
10	Bangladesh	Disaster-Resilient Leadership	Supports learning continuity during floods (Hamid & Hasan, 2025)	Develop community-based emergency education plans.

### 3.5. Conceptual Outputs Identified in the Literature

The distribution of leadership patterns across countries and ecological contexts is summarized in Table 2. The table presents the country of study, leadership focus reported, and key empirical findings documented in each article, without interpretative extrapolation.



**Figure 2. Conceptual Model of Effective School Leadership in Ecological Education Systems**

Several reviewed studies included conceptual or visual representations of leadership frameworks linking leadership practices with ecological or social contexts. These conceptual models varied in structure and scope but commonly depicted interactions between leadership behavior, environmental conditions, and community engagement. The aggregation of these representations informed the identification of leadership dimensions reported across the literature. Figure 2 presents a synthesized visualization derived from the reviewed studies to illustrate the leadership dimensions documented in ecologically vulnerable educational settings.

#### 4. Discussion

The findings of this study indicate that effective school leadership in wetland environments reflects a complex synthesis of transformational, instructional, and ecological-social dimensions, which together constitute an adaptive leadership configuration for ecologically vulnerable regions. In such settings, principals are required not only to perform administrative and managerial functions but also to exercise cultural sensitivity, environmental awareness, and emotional intelligence in navigating uncertainty. At a theoretical level, this study does not merely confirm transformational leadership theory, which emphasizes vision, moral influence, and individualized consideration as drivers of organizational change (Cabrera & Cabrera, 2019; Yoon et al., 2016; Romadhon & Effendi, 2025; Azmi et al., 2018), but refines it by specifying the ecological and socio-cultural conditions under which these mechanisms remain effective, attenuated, or reconfigured. Empirical evidence from Vietnam and Peru reports positive associations between visionary leadership and teacher commitment or emotional well-being (Tran et al., 2023; Muguerza-Florián et al., 2025); however, such findings are predominantly correlational and institution-centric, implicitly assuming cross-contextual stability of leadership effects. By contrast, this study demonstrates that environmental volatility and community dependency, defining features of wetland regions, act as contextual moderators that reshape how transformational practices operate, thereby advancing transformational leadership from a context-neutral model toward a conditional and ecologically situated theory.

Within Indonesia's context, particularly in South Kalimantan province, the incorporation of *gawi sabumi* as an ethical foundation of leadership represents not a symbolic cultural enrichment but a theoretical extension that embeds leadership processes within a socio-ecological governance system. Prior studies advocating cultural integration frequently position local values as normative complements to leadership style, without articulating how such values function as decision-making logics under ecological stress. This study advances the literature by theorizing cultural values as operational mechanisms, guiding collective action, risk negotiation, and adaptive coordination, rather than as moral attributes of individual leaders. In doing so, the study extends transformational leadership theory beyond its original psychological and organizational focus into a relational-ecological domain, where leadership effectiveness emerges from the interaction between culture, environment, and institutional constraints.

The analysis also sharpens instructional leadership theory through theory refinement rather than confirmation. Marzano et al. (2005) and subsequent studies (Fred & Singh, 2021; Hassan et al., 2022; Tep, 2022) conceptualize instructional leadership as a stabilizing force achieved through alignment of vision, curriculum, and pedagogy, a view reinforced by Leithwood (2021). However, these models implicitly assume relatively stable instructional cycles and infrastructural continuity. Findings synthesized in this study indicate that, in wetland environments where flooding and access disruption recurrently interrupt schooling, instructional leadership must be reconceptualized as adaptive orchestration of learning under discontinuity, rather than routine supervision and alignment. This refines instructional leadership theory by identifying its boundary conditions and highlighting its dependency on ecological predictability assumption largely unexamined in prior literature.

Sustainable and disaster-resilient leadership further contributes to theory extension, particularly by integrating organizational resilience with ecological governance. Studies from Malaysia and Nigeria associate sustainable leadership with positive school climate and resilience (Abdul Rahim et al., 2023; Eze & Okoro, 2023), aligning with resilience theory that emphasizes adaptive capacity and proactive communication (Everly Jr et al., 2013). Case-based work from Brazil and the Amazon (Roman et al., 2021; Virtanen, 2022) illustrates leadership embedded in ecological knowledge and community practice. However, these studies remain largely descriptive and context-bound, offering limited abstraction. This study extends sustainable leadership theory by linking ecological embeddedness to governance tensions, explicitly addressing how leaders negotiate trade-offs between standardized educational accountability and locally adaptive ecological practices—an aspect under-theorized in existing models.

More broadly, this study contributes to leadership theory by reframing leadership effectiveness as an emergent property of interacting systems, rather than an aggregation of individual competencies. While Bronfenbrenner's (2009) ecological systems theory is frequently cited, leadership research often employs it metaphorically without operational depth. The present analysis refines this theoretical stance by demonstrating how internal factors (leader competence, digital literacy, reflective capacity) and external factors (policy regimes, organizational culture, community relations) co-evolve within wetland ecosystems (Hai, 2025; Tep, 2022; Abdul Rahim et al., 2023; Owan, 2019). Leadership, therefore, is not merely enacted within systems but is constituted through system interactions, challenging the individualistic bias prevalent in leadership scholarship.

In wetland regions, effective leadership is sustained through the interplay of personal competence, school climate, institutional and community support, ecological adaptability, and cultural integration. While culturally responsive leadership frameworks emphasize legitimacy and trust (Suriansyah et al., 2019), they often under-theorize the structural tensions leaders face when bureaucratic compliance conflicts with community-based ecological solutions. This study refines culturally responsive leadership by foregrounding such tensions as analytically central rather than peripheral, thereby moving the framework from normative prescription toward explanatory robustness.

Within South Kalimantan province, the prospects for implementing an ecological-social leadership model are theoretically promising precisely because the region provides conditions for theory refinement rather than mere application. Although its ecological profile parallels regions such as the Mekong Delta, Pantanal, and Cross River State, this study cautions against the uncritical transfer of leadership models across contexts. Instead, it positions wetland schools in South Kalimantan as empirical sites for testing the limits, contingencies, and adaptive transformations of existing leadership theories. In this sense, the study contributes not only by extending leadership theory into ecological domains but also by refining its core assumptions about context, stability, and agency in ecologically vulnerable educational systems.

## 5. Conclusion

Based on the analysis and discussion of twenty international studies, this research concludes that effective school leadership in wetland environments requires an integrative, contextual, and socio-ecological approach. The results confirm the initial hypothesis that school principals operating in geographically extreme conditions, such as recurrent flooding, transportation isolation, and limited infrastructure, must possess not only administrative competence but also adaptive intelligence and ecological awareness to ensure school sustainability. The study's objectives to identify leadership characteristics, influencing factors, and applicable models are met through the discovery of three interrelated leadership dimensions: transformational, instructional, and sustainable leadership. Transformational leadership fosters teacher motivation, collective commitment, and moral vision; instructional leadership ensures pedagogical quality and

context-based learning; while sustainable and ecological leadership enables resilience against environmental risks and promotes long-term community engagement. The findings also highlight that leadership effectiveness is shaped by both internal factors, such as competence, communication, and moral values, and external factors, including policy support, organizational culture, community collaboration, and local wisdom. The proposed socio-ecological leadership model, rooted in Banjar cultural values of gawi sabumi and environmental stewardship, offers a contextually grounded framework for strengthening educational leadership in South Kalimantan province. This model not only aligns with the realities of wetland ecosystems but also supports Indonesia's broader agenda for equitable and sustainable education. Therefore, developing school leadership in wetland regions should be regarded as both a practical necessity and a strategic pathway toward achieving educational resilience, cultural relevance, and environmental harmony. Future research is encouraged to empirically validate this model through field implementation, comparative case studies, and the integration of digital learning systems to enhance principals' capacity for adaptive, transformative, and sustainable leadership in similar ecological contexts.

### Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### References

- Abdul Rahim, M. H., Hamzah, M. I. M., & Hamid, A. H. A. (2023). Sustainable leadership practices among school leaders and their relationship with school climate. *International Journal of Evaluation and Research in Education*, 13(1), 201–211. <https://doi.org/10.11591/ijere.v13i1.26287>
- Abdulai, N. L. (2025). Transformational leadership practices and its implications on school climate towards teacher retention in rural areas, Ghana. *GPH-International Journal of Social Science and Humanities Research*, 8(5), 40–55. <https://doi.org/10.5281/zenodo.15535008>
- Azmi, N., Sobri, A., & Nurabadi, A. (2018). KEPEMIMPINAN EKOLOGIS KEPALA SEKOLAH DALAM PEMBENTUKAN SEKOLAH BERBUDAYA LINGKUNGAN. *Jurnal Administrasi Dan Manajemen Pendidikan*, 1, 327–336. <https://doi.org/10.17977/um027v1i32018p327>
- BRONFENBRENNER, U. (2009). *The Ecology of Human Development*. Harvard University Press. <https://books.google.co.id/books?id=8cf0FYm0jW0C>
- Cabrera, D., & Cabrera, L. (2019). Complexity and Systems Thinking Models in Education: Applications for Leaders (pp. 1–29). [https://doi.org/10.1007/978-3-319-17727-4\\_101-1](https://doi.org/10.1007/978-3-319-17727-4_101-1)
- Cresencio, M., & Yabut, E. (2023). Implementation of school disaster risk reduction in coastal schools: Basis for a plan of action. *Journal of Education and E-Learning Research*, 10(2), 270–277. <https://doi.org/10.20448/jeelr.v10i2.4592>
- Dawson, L., Elbakidze, M., Schellens, M., Shkaruba, A., & Angelstam, P. K. (2021). Bogs, birds, and berries in Belarus: The governance and management dynamics of wetland restoration in a state-centric, top-down context. *Ecology and Society*, 26(1).
- Ekayani, N. W. D., Findyartini, A., Anugrapaksi, E., & Nadarajah, V. D. V. (2023). Integration of leadership training in the medical and health profession education curricula. *Jurnal Pendidikan Kedokteran Indonesia: The Indonesian Journal of Medical Education*, 12(1), 102–108.
- Escasinas, D. R. M., & Padro, P. C. (2024). Exploring school leaders' experiences in the implementation of alternative delivery modalities during calamities. *International Journal for Multidisciplinary Research*, 6(4). <https://www.ijfmr.com/publication-archive.php?volume=6&issue=4#papers-index>

- Everly Jr, G. S., Smith, K. J., & Lobo, R. (2013). Resilient leadership and the organizational culture of resilience: construct validation. *International Journal of Emergency Mental Health*, 15(2), 123–128.
- Eze, C. M., & Okoro, I. C. (2023). Environmental hazards and principals' management of facilities in secondary schools in Rivers State. *Nigerian Journal of School of Educational Administration and Management*, 17(2), 150–162. <https://njseam.com/volume-2-no-1-december-2023/>
- Fadlillah, M. (2019). The development of an integrative holistic program in early childhood care and education: A policy in the Indonesian context. *Indian Journal of Public Health Reseach and Developpent*, 10(12), 1803–1806.
- Fauzi, A., Suryapermana, N., Wahyuni, A., & Gofur, R. (2023). Indonesian education services quality: The influence of leadership and total quality management. *Pedagogika*, 149(1), 105–122.
- Flores, C. A. da S., Maier, S. R. de O., Moura, A. A. de, Balsanelli, A. P., Dias, B. M., & Bernardes, A. (2022). Authentic leadership in the educational system and in nursing education: an integrative review. *Revista Brasileira de Enfermagem*, 75(1), e20220122.
- Fred, A., & Singh, G. S. B. (2021). Instructional leadership practices in under-enrolled rural schools in Miri, Sarawak. *Asian Journal of University Education*, 17(1), 165–176. <https://education.uitm.edu.my/ajue/?p=1063>
- Hafizi, R., Suyoto, S., Rahmadi, R., Aslamiah, A., & Cinantya, C. (2025). PENGARUH GAYA KEPEMIMPINAN TRANSFORMASIONAL DAN BUDAYA ORGANISASI TERHADAP KINERJA GURU DI ERA DIGITAL. *Jurnal Manajemen Pendidikan*, 10(3), 1081–1089. <https://doi.org/10.34125/jmp.v10i3.728>
- Hai, V. V. B. (2025). Managing training and self-training activities for high school principals in the Mekong Delta region in the context of digital transformation. *Journal of Social Review and Development*, 4(3), 39–46. <https://doi.org/10.64171/JSRD.4.3.39-46>
- Hamami, T., & Nuryana, Z. (2022). A holistic–integrative approach of the Muhammadiyah education system in Indonesia. *HTS Teologiese Studies/Theological Studies*, 78(4).
- Hamid, K. S., & Hasan, K. M. (2025). Leadership of head teachers in flood-affected communities of Lakshmipur, Bangladesh. *Studies in Social and Educational Research Review*, 12(1), 371–377. <https://sserr.ro/>
- Hassan, R., Boon, Y., Ahmad, J., & Tahir, L. M. (2022). Instructional Leadership Practices: Exploring Malaysia Primary Principals Strategies. *Journal of Positive School Psychology*, 6(3).
- Hayati, N., Royyan, M. G., Arief, R., & Darminto, M. R. (2023). The use of Sentinel-1 in response to sequences of natural disasters in Indonesia: the South Kalimantan floods and the Mamuju-Majene earthquake. *IOP Conference Series: Earth and Environmental Science*, 1127(1), 012008.
- Jesson, J. K., Matheson, L., & Lacey, F. M. (2011). *Doing your literature review: Traditional and systematic techniques*. SAGE Publications Ltd.
- Leithwood, K. (2021). A review of evidence about equitable school leadership. *Education Sciences*, 11(8), 377.
- Machi, L. A., & McEvoy, B. T. (2016). *The literature review: Six steps to success* (3, Ed.). Corwin Press.
- Magnus, A., Chiawolam, J., Zaifada, B. I., Kpee, G. G., & Ekeh, D. O. (2019). Principals' leadership needs for effective management of secondary schools in Rivers State, Nigeria. *European Journal of Education Studies*, 6(1). <https://oapub.org/edu/index.php/ejes/article/view/2408>
- Martono, S., Khoiruddin, M., WIJAYANTO, A., RIDLOAH, S., WULANSARI, N. A., & Udin, U. (2020). Increasing teamwork, organizational commitment and effectiveness through the implementation of collaborative resolution. *The Journal of Asian Finance, Economics and Business*, 7(6), 427–437.
- Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School Leadership That Works: From Research to Results*. ASCD. [https://books.google.co.id/books?id=mo\\_gEAAAQBAJ](https://books.google.co.id/books?id=mo_gEAAAQBAJ)

- Matori, R., & Arifianto, F. (2022). Potensi risiko banjir menggunakan Sistem Informasi Geografis (SIG) pada DAS Mahakam Kalimantan Timur. *The Climate of Tropical Indonesia Maritime Continent Journal*, 1(2).
- Mawar, R. W., & Tuti, N. H. (2018). M. Sahrul, "The portrait of education in the Indonesia-Malaysia Border Area: Case study of Entikong Subdistrict, Sanggau District, West Kalimantan Province,." *International Journal of Scientific Research and Education*, 6(11), 8051–8056.
- Muguerza-Florián, E., García-Salirrosas, E. E., Villar-Guevara, M., & Fernández-Mallma, I. (2025). Investigating the association between transformational leadership and job satisfaction: The role of gratitude towards the organization in the Peruvian context. *Administrative Sciences*, 15(9), 349. <https://doi.org/10.3390/admsci15090349>
- Owan, V. J. (2019). School-community relationship and school system effectiveness in secondary schools in Cross River State. *World Journal of Vocational Education and Training*, 1(1), 11–19. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3394443](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3394443)
- Passy, R., & Ovenden-Hope, T. (2019). Exploring school leadership in coastal schools: 'Getting a fair deal' for students in disadvantaged communities. *Journal of Education Policy*, 35(2). <https://doi.org/10.1080/02680939.2019.1573382>
- Rahmadi, A., Istiqamah, I., & Adriyanto, M. (2010). Education in Remote Areas from Teacher's Perspectives: A case study of East Kalimantan, Indonesia. In *Education Counts*.
- Ridley, D. (2012). *The literature review: A step-by-step guide for students* (2, Ed.). SAGE Publications Ltd.
- Rokhman, F., Purnomo, A., Yuwono, A., Saputro, I. H., Plangson, B., & Habibi, A. F. (2024). Sustainable ecosystem for professional teachers in Indonesia: The role of teacher professional education programs in achieving the SDGs. *E3S Web of Conferences*, 568, 04033.
- Romadhon, R., & Effendi, Y. R. (2025). Transformational Leadership: Strategies for Creating Green Environments in Indonesian Schools. *Journal of Management World*, 2025(1), 500–511. <https://doi.org/10.53935/jomw.v2024i4.724>
- Roman, A. S. G. dos S., Rizzo, D. T. de S., Zaim-de-Melo, R., Neira, M. G., & Rizzo, J. G. de S. (2021). Caracterização das "Escolas das Águas": Revisão de literatura e perspectivas para a pesquisa. *Research, Society and Development*, 10(5), e50110515321. <https://doi.org/10.33448/rsd-v10i5.15321>
- Sari, N. P., Setiawan, M. A., Makaria, E. C., Putro, H. Y. S., Saputra, D. G., & Ananda, P. (2025). Mapping Adolescent Cyberbullying in Wetland Communities: An Ecological Analysis Based on Bronfenbrenner's Theory. *G-Couns: Jurnal Bimbingan Dan Konseling*, 10(01), 861–874. <https://doi.org/10.31316/g-couns.v10i01.8523>
- Setiawan, M. A., Sari, N. P., Suryo Putro, H. Y., & Mara, A. A. P. T. (2025). Older Sibling or Younger Sibling? The Dynamics of Self-Confidence and Emotional Stability Among University Students in Wetland Communities. *G-Couns: Jurnal Bimbingan Dan Konseling*, 10(01), 516–526. <https://doi.org/10.31316/g-couns.v10i01.8381>
- Suriansyah, A., Aslamiah, A., Noorhapizah, N., Winardi, I., & Dalle, J. (2019). The relationship between university autonomy, lecturer empowerment, and organizational citizenship behavior in Indonesian universities. *Journal of Social Studies Education Research*, 10(4), 127–152.
- Tejada, J. A., & Chieng, M. L. P. (2024). Exploring the leadership of school heads assigned in last-mile schools: A phenomenology. *EPRA International Journal of Multidisciplinary Research*, 10(4). <https://doi.org/10.36713/epra16475>
- Tep, S. (2022). The correlation between instructional leadership and efficacy among the Cambodian public lower secondary school teachers. *Jurnal As-Salam*, 6(2), 163–180. <https://doi.org/10.37249/assalam.v6i2.437>

- Tran, V. D., Huynh, T. T. V., & Le, T. A. D. (2023). Effects of principals' leadership styles on teachers' commitment in Vietnam. *International Journal of Evaluation and Research in Education*, 12(3), 1572–1581. <https://doi.org/10.11591/ijere.v12i3.25225>
- Uy, F., Barot, J., Longakit, L. J., Olasiman, S. F., & Dela Cruz, R. A. (2024). The role of Philippine school principals as community leaders in educational reform. *International Multidisciplinary Journal of Research for Innovation, Sustainability, and Excellence*, 1(11), 388–395. <https://risejournals.org/index.php/imjrise/article/view/873>
- Virtanen, P. K. (2022). Relational epistemology and Amazonian land-based education: Learning the environment through everyday activities. *Anthropology & Education Quarterly*, 53(2), 162–181. <https://doi.org/10.1111/aeq.12421>
- Warni, H., Arifin, S., & Arifin, R. (2020). Problematic Education Physical Students in the Wetlands. 1st South Borneo International Conference on Sport Science and Education (SBICSSE 2019), 8–10.
- Yoon, T. K., Kim, S., Takano, T., Yun, S.-J., & Son, Y. (2016). Contributing to Sustainability Education of East Asian University Students through a Field Trip Experience: A Social-Ecological Perspective. *Sustainability*, 8(10), 1067. <https://doi.org/10.3390/su8101067>