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Panca Datu Logic Framework for Sustainability Evaluation: Conceptual Development and Three Case Simulations from Bali

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Abstract: Many public and organizational programs achieve technical success, regulatory compliance, and high budget absorption, yet fail to sustain outcomes once external support ends, as prevailing evaluation frameworks emphasize outputs over sustainability. This gap reflects the absence of an integrated perspective on how institutional conditions shape long-term durability. This paper proposes the *Panca Datu* Logic Framework (PDLF), where *panca* denotes "five" and *datu* denotes foundational elements, as a conceptual guide for sustainability evaluation. Using a conceptual-synthetic approach grounded in abductive reasoning, the framework is illustrated through three case-based simulations in Bali: rabies control, community-based turtle conservation, and waste management programs. The PDLF conceptualizes sustainability as an emergent, non-compensatory property arising from alignment among five domains—legal, human, financial, infrastructure, and culture—with culture positioned as an outcome of systemic coherence. The framework offers an analytical lens to explain both program fragility and sustained performance across institutional and geographical gradients spanning local, national, and global contexts.

Keywords: program sustainability; institutional foundations; emergent; non-compensatory; *panca datu* logic framework

1. Introduction

Across public programs, development projects, and policy interventions in diverse sectors, a recurring pattern is frequently observed: initiatives may demonstrate satisfactory technical performance, procedural compliance, and high levels of budget absorption during implementation, yet fail to sustain outcomes once the intervention period ends. This phenomenon has been widely associated with isomorphic mimicry, where organizations perform well on

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visible indicators of success—such as budgets spent and compliance achieved—without building the underlying functional capability required for long-term effectiveness (Pritchett et al., 2013; Andrews et al., 2017). In the Indonesian context, this pattern is reinforced by bureaucratic practices that frequently equate program success with the full realization of allocated budgets and the completion of administrative reports, regardless of long-term program utility (World Bank, 2014). As a result, a project-oriented governance culture has often produced infrastructures and initiatives that remain operational only during the funded implementation phase and struggle to transition into sustainable institutional arrangements (Asian Development Bank, 2018; Bappenas, 2019).

In Bali, similar patterns of post-intervention fragility are also observed across a range of environmental and community-based programs. Initiatives in areas such as waste management, rabies control, and community-based tourism often demonstrate strong initial performance during periods of active funding and supervision, including high levels of community participation, technical execution, and administrative compliance. However, these outcomes frequently weaken once external support is reduced or withdrawn, revealing underlying institutional misalignment. This condition is also reflected in the presence of public and privately supported infrastructures that become underutilized or fall into disrepair after the initial implementation phase, indicating a gap between project delivery and long-term operational sustainability.

Studies on Bali-based programs indicate that challenges persist in regulatory consistency, enforcement at the local level, financial governance, and the internalization of collective norms, resulting in sustainability that is often situational rather than systemic (Dalem et al., 2026; Rusadi et al., 2026; Widanti, 2026). These recurring patterns suggest that, despite strong cultural and social capital, long-term program sustainability in Bali remains contingent upon the alignment of multiple institutional conditions rather than the success of isolated interventions. These patterns highlight a critical distinction between short-term project effectiveness and long-term sustainability. Many initiatives demonstrate strong performance while external supervision, funding, or technical support remains in place, yet deteriorate once these external supports are withdrawn (Gruen et al., 2008).

When programs fail to sustain their outcomes, explanations are often framed in terms of operational shortcomings, limited resources, or implementation errors. However, repeated cycles of program redesign, increased funding, and improved technical inputs have frequently failed to generate more durable results (Ji and Hong, 2025; Murphy, 2026). These recurring experiences suggest that sustainability challenges cannot be understood solely through technical performance or resource availability. Instead, program trajectories are strongly shaped by broader institutional and social conditions. These include how formal rules are enacted in practice (Gofen, 2013; Habicht and Pelto, 2019), how individuals behave within organizational systems, including the discretionary routines of street-level bureaucrats (Brodkin, 2011; May and Winter, 2007), how resources are governed through collective arrangements (Joubert and Summers, 2018; Raymond et al., 2023), and how informal institutional norms such as patronage or clientelism evolve over time (Helmke and Levitsky, 2004). When these conditions are misaligned, programs may function effectively under intensive oversight but remain fragile once external controls are relaxed (Hupe, 2023; van Tulder and Keen, 2018).

Despite extensive research on program implementation, institutional governance, and sustainability, existing analytical frameworks often treat these dimensions separately or assume that weaknesses in one area can be compensated by strengths in others (Pritchett et al., 2013; Andrews et al., 2017). As a result, they provide limited explanation for why technically successful programs frequently collapse once external oversight is withdrawn. This limitation suggests the need for a more integrated conceptual perspective capable of examining sustainability as a systemic property emerging from the alignment of multiple institutional conditions.

Insights into such systemic alignment can be drawn from long-standing institutional traditions that emphasize balance and interdependence. In Bali, for instance, the resilience of centuries-old systems such as the *Subak* irrigation networks and *Desa Adat* customary villages suggests that sustainability is not the product of a single dominant factor, but rather an emergent property arising from the interaction of multiple institutional elements (Lansing, 1987; Lansing and Kremer, 1993; Pitana, 2010; Ardana et al., 2024; Sukanteri et al., 2026). These institutional experiences parallel insights from contemporary complexity theory, which emphasizes that stability in complex systems depends on the alignment of multiple foundational components rather than the dominance of a single variable.

This article responds to these challenges by proposing the *Panca Datu* Logic Framework (PDLF). The term *Panca Datu* originates from Balinese Hindu ritual traditions, where five foundational elements are symbolically embedded within temples and sacred structures to represent balance and structural integrity (Asmariani et al., 2025; Sumantra et al., 2023). In this paper, the concept is not used in its doctrinal religious sense but is adopted as an analytical metaphor for systemic completeness in program sustainability.

2. Literature Review

A substantial body of literature has examined program performance and policy effectiveness through structured evaluation frameworks. Dominant approaches such as the Logical Framework Approach, Results-Based

Management, Performance Indicator Systems, and compliance-oriented audit models have been widely adopted in public policy, development programs, and organizational interventions (Arias et al., 2022; Cordova-Pozo et al., 2018; Couillard et al., 2009; Crawford and Bryce, 2003; Santos et al., 2025; Klimaitienė et al., 2020; Wagner et al., 2014). These frameworks primarily focus on strengthening accountability, monitoring implementation progress, and ensuring consistency between planned activities, outputs, and budget utilization.

While these approaches have significantly improved monitoring and reporting systems, a growing body of research highlights important limitations in output- and compliance-oriented evaluation models. One frequently identified challenge is the fragmented alignment of program indicators. Evaluation systems may track numerous performance metrics, yet these indicators are often developed and monitored within separate organizational or functional domains rather than examined as parts of an interconnected system. Consequently, such approaches are effective in documenting short-term administrative performance but provide limited insight into the institutional mechanisms that sustain program outcomes once external enforcement or funding is reduced (Mkhize and Nel-Sanders, 2025; Mora et al., 2023; Petković et al., 2025). Scholars have therefore argued that an overreliance on disconnected indicators tends to privilege visible outputs and procedural compliance while overlooking the institutional and behavioural conditions that shape long-term sustainability (Devineni, 2021; Hesselmans et al., 2025).

Evidence of these limitations becomes particularly visible in program replication processes. Numerous studies report that initiatives redesigned with improved technology or expanded budgets frequently reproduce similar patterns of failure across different contexts (Abbasi et al., 2013; Gauld, 2007; Mora et al., 2023; Petković et al., 2025; Sutterfield et al., 2006). Research consistently demonstrates that program failure rarely stems from technical inadequacy alone. Instead, it is often associated with persistent weaknesses in mission clarity, stakeholder engagement, and human capacity across the program life cycle (Alias et al., 2014; Gupta et al., 2018; Herath and Chong, 2021; Pinto and Mantel, 1990). These findings suggest that sustainability challenges are not merely operational problems but are embedded within broader institutional arrangements.

In response to these observations, scholars from multiple disciplines have examined institutional dimensions believed to influence program sustainability. Legal and governance studies emphasize the importance of regulatory clarity and institutional consistency (Andrews et al., 2017; Larcker and Tayan, 2016; Wattoo, 2025; World Bank, 2017a; World Bank, 2017b). Research in human resource management highlights the role of competence, leadership, and integrity in shaping organizational performance (Bindeeba et al., 2025;

Brinkerhoff and Morgan, 2010; Gammage et al., 2025; Otoo et al., 2009; Roundy and Burke-Smalley, 2022). Financial governance literature focuses on budgeting systems, accountability mechanisms, and resource allocation practices (Majer and Makuac, 2023; Schick, 2014; Shanikat and Aldabbas, 2025). Studies on infrastructure and technological systems examine the role of institutional capacity and technological support in enabling program continuity (Briceno-Garmendia and Foster, 2010; Croteau et al., 2001; Dixon and Loukus, 2013; Heeks, 2002; Nassani et al., 2024).

At the same time, a substantial body of research highlights the importance of cultural and normative dimensions. Studies on organizational culture, social norms, trust, and collective ownership demonstrate that informal institutions strongly influence whether formal rules are internalized or followed only under conditions of external monitoring (Arias et al., 2022; Ghumiem et al., 2023; Ostrom, 2000; Rostain, 2021). These studies collectively show that program sustainability is shaped not only by formal institutional arrangements but also by behavioural and normative dynamics operating within organizations and communities.

Despite these important contributions, existing scholars typically examine these institutional dimensions within separate analytical traditions. As a result, indicators of legal governance, human capacity, financial management, infrastructure support, and cultural norms are frequently developed and analysed independently (van Driel et al., 2022). This fragmentation limits the ability of existing frameworks to explain how interactions among these dimensions influence long-term program sustainability. In particular, culture is often treated as an independent explanatory variable rather than as a phenomenon that emerges from the interaction of institutional rules, governance structures, and collective practices (Gaonkar and Sukthankar, 2025). Such fragmentation implicitly encourages compensatory reasoning, where strength in one dimension, such as funding or infrastructure, is assumed to offset weaknesses in others (Penker and Seebauer, 2023).

However, empirical experiences across multiple sectors increasingly suggest that sustainability follows a non-compensatory logic. Programs may achieve strong performance under conditions of intensive oversight yet remain structurally fragile when foundational institutional conditions are misaligned. Weak legal legitimacy, compromised human integrity, ineffective financial governance, or the absence of internalized social norms can undermine sustainability even when technical capacity and funding appear adequate. These observations indicate the need for a more integrated analytical framework capable of examining sustainability as a systemic property emerging from the alignment of multiple institutional dimensions rather than from isolated performance indicators.

This conceptual gap motivates the development of the PDLF, which is introduced in the following section as a systemic conceptual model for understanding program sustainability. The term *Panca Datu* originates from Balinese Hindu ritual traditions, where five sacred metals are embedded within the *pedagingan* of temples and other sacred structures (Asmariani et al., 2025; Sumantra et al., 2023). Historical accounts in Balinese religious literature associate the concept with the teachings of Rsi Markandeya, who is widely regarded as one of the early figures introducing Hindu ritual traditions in Bali (Stuart-Fox, 2010, p. 307). Within ritual practice, these metals symbolically represent foundational elements intended to ensure balance and structural integrity within the cosmological order of Balinese Hinduism.

In this present work, *Panca Datu* is not treated as a doctrinal religious theory but is adopted as a conceptual metaphor for systemic completeness. Within this perspective, sustainability is understood as emerging from the alignment of multiple foundational elements, where the absence of one component cannot be compensated by the presence or strength of others. This non-compensatory logic provides an analytical lens for examining institutional fragility in program governance and forms the conceptual basis of the PDLF.

3. Method and Theory

3.1 Method

This work employs a conceptual-synthetic method grounded in an integrative research design (Jaakkola, 2020; Torraco, 2016). Rather than testing isolated hypotheses through primary data collection, it aimed to develop a conceptual framework that explains the systemic conditions influencing program sustainability. The approach therefore relies on abductive reasoning (Gioia et al., 2013) and theory-building principles (Reigeluth and Carr-Chellman, 2009) to synthesize insights from diverse bodies of literature.

The analytical material for this article consists of scholarly literature addressing program evaluation, institutional governance, organizational behaviour, and sustainability. Relevant publications were identified through a targeted search of academic databases such as Scopus and Google Scholar. Priority was given to peer-reviewed studies discussing program performance, institutional capacity, governance systems, and long-term sustainability challenges across public sector and development interventions.

This approach enables a high-level synthesis of insights drawn from multiple disciplinary perspectives, ranging from institutional governance and organizational theory to empirical studies documenting program implementation outcomes. By integrating these strands of scholarship, the study moves beyond descriptive review toward the construction of a generative conceptual model capable of explaining persistent patterns of post-intervention program failure.

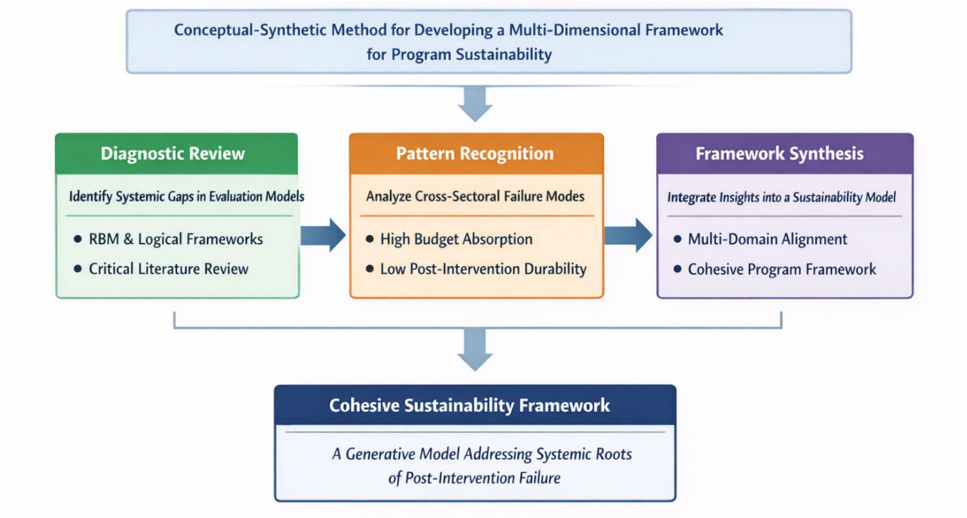

Figure 1. Conceptual-synthetic methodological framework leading to PDLF. It illustrates the three-stage process of diagnostic review, pattern recognition, and framework synthesis (Source: authors).

The analytical process followed a three-stage systematic approach as presented in Figure 1. First, a diagnostic review was conducted to identify structural limitations in dominant evaluation frameworks (such as Results-Based Management and Logical Framework approaches) through critical examination of existing literature. Second, a pattern recognition stage identifies recurring cross-sectoral identification of failure patterns in programs that demonstrate strong administrative performance (e.g., high budget absorption or compliance indicators) but exhibit weak sustainability after external oversight or funding is withdrawn. Third, a framework synthesis stage integrated these recurring patterns into a systemic conceptual model in which sustainability is interpreted as a function of alignment across multiple institutional domains.

Through this synthesis process, recurring explanatory dimensions identified in the literature were clustered into five institutional domains: legal arrangements, human integrity, financial governance, infrastructure reliability, and culture. These domains form the analytical structure of the PDLF, which conceptualizes program sustainability as an emergent property arising from the systemic alignment of these interdependent institutional conditions.

To illustrate the analytical utility of the proposed framework, the PDLF is applied through three structured case simulations: (1) the Rabies Control

Program in Bali, (2) Sea Turtle Conservation and Ecotourism Perancak, Bali; and (3) a community-based waste management program in Bali.

3.2 Theory

The theoretical foundation of this study is the PDLF, a systemic model that conceptualizes sustainability as an emergent property of five interdependent domains: (1) Legal Arrangements, (2) Human Integrity, (3) Financial Governance, (4) Infrastructure Reliability, and (5) Culture. The illustration of these five elements (*Datu*) is shown in Figure 2. The five interdependent pillars (*Datu*) function synergistically to support effective, resilient, and sustainable programs, while the central tree with deep roots symbolizes sustainability and balance at the core of the framework.

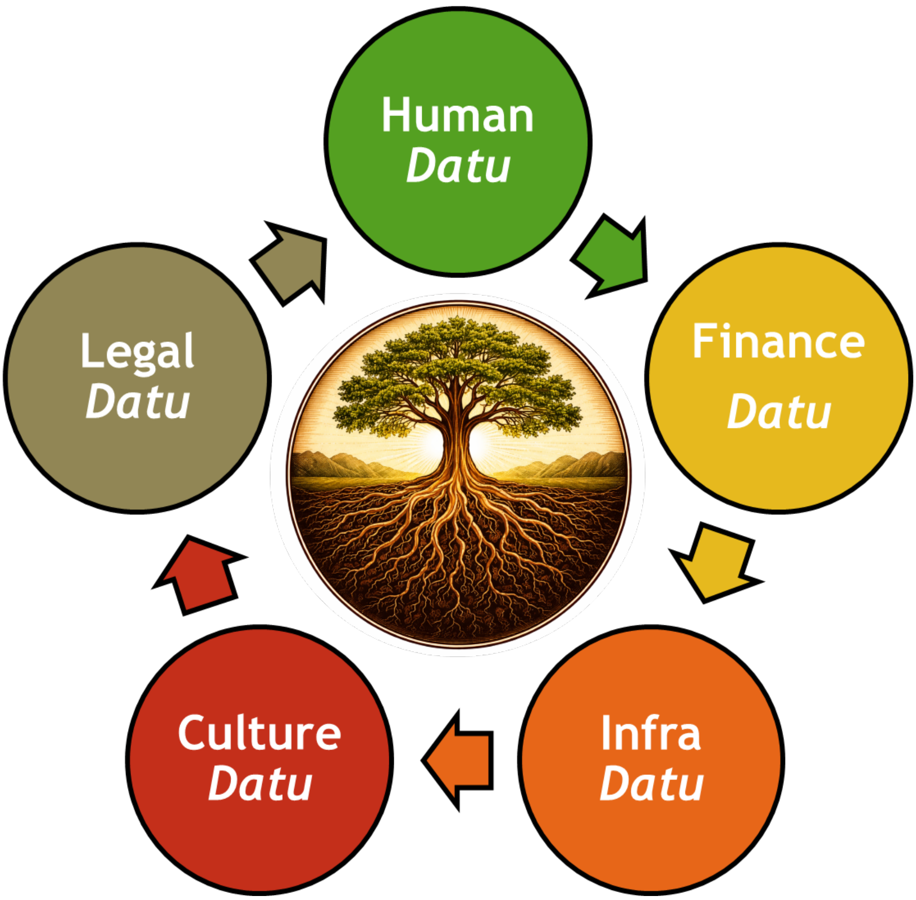

Figure 2. *Panca Datu* Logic Framework (PDLF). It shows five interdependent domains—legal, human, financial, infrastructure, and culture—that support program sustainability through their alignment (Source: Authors' illustration, generated with AI assistance).

Table 1 presents the key analytical dimensions and illustrative indicators of systemic weakness associated with each element of the PDLF. Rather than serving as a checklist of performance metrics, the table functions as a diagnostic guide to identify structural misalignment across legal, human, financial, infrastructural, and cultural domains. Consistent with the framework's non-compensatory logic, the presence of weakness in any single domain signals systemic fragility that cannot be offset by strengths in others.

The Logic of Non-Compensatory Balance

While the framework utilizes Balinese terminology, it is not a codification of customary law. Instead, it adopts the Balinese ontological logic of *Panca Datu* (five foundational elements) as a theoretical metaphor for systemic completeness. In this logic, elements are non-compensatory; a surplus in one domain (e.g., massive financial input) cannot substitute for a deficit in another (e.g., lack of human integrity). This mirrors the Balinese ritual of pedagingan, where the absence of a single foundational element renders the entire structure "hollow" or unsustainable (Sumantra et al., 2023).

The operational definitions of the domains are as follows: (1) Legal Arrangements: The perceived legitimacy, credibility, and consistency of governance rules; (2) Human Integrity: Beyond technical competence, this includes adaptive capacity and the internal "driving force" that sustains commitment; (3) Financial Governance: The alignment of resource allocation with long-term objectives rather than short-term absorption; (4) Infrastructure: Physical assets and non-physical systems (data and information flows) that support decision-making; (5) Culture (The Emergent Outcome): In a departure from traditional models, culture is not treated as an input variable. It is defined as the collective "soul" or outcome that emerges only when the other four domains achieve functional alignment. Culture, within the PDLF, refers to the emergent pattern of internalized norms, trust, shared ownership, and routine compliance. This notion of culture does not denote inherited traditions, identity-based values, or symbolic practices. Rather, it describes a functional governance culture that becomes visible when rules are perceived as legitimate, human actors possess integrity and agency, financial resources are transparently governed, and infrastructure reliably supports everyday decision-making.

By positioning culture as an emergent result of systemic coherence, the PDLF provides a diagnostic lens to identify "fragility points" in programs. Sustainability is thus viewed not as a cumulative score of fragmented indicators, but as the integrity of the system as a whole.

Table 1. Some key analytical dimensions and indicators of systemic weakness for each element of the PDLF

Component	Core Focus	Key Analytical Dimensions	Indicators of Systemic Weakness
Datu Legal	Legal legitimacy and enforceability	Existence, quality, and consistency of rules	Rules remain normative or symbolic
		Fair and impartial enforcement	Selective or inconsistent enforcement
		Governance structures and decision-making processes	Policies frequently adjusted due to short-term or power pressures
		Perceived legitimacy and binding power of regulations	Compliance driven by surveillance rather than internalized legitimacy
Datu Human Resources	Quality and behavior of people within the system	Technical competence and adaptive capacity	Overemphasis on technical training alone
		Integrity and ethical orientation	Marginalization of competent and principled individuals
		Communication skills and social engagement	Normalization of opportunistic behavior
		Alignment between formal knowledge and operational realities	Structural disincentives for integrity and learning
Datu Financial Resources	Integrity and sustainability of financial governance	Budget orientation and allocation logic	Short-term, absorption-oriented funding
		Transparency, accountability, and efficiency	Weak financial controls and governance
		Alignment of financial flows with long-term objectives	Increased funding without outcome improvement
		Protection from leakage and conflicts of interest	Amplification of inefficiency and systemic vulnerability
Datu Infrastructure	Operational and systemic capacity	Availability and quality of physical infrastructure	Overinvestment in visible assets only
		Soft infrastructure: data systems, information flows, monitoring, decision-support	Absence of reliable data and information systems
		Maintenance, accessibility, and operational fit	Reliance on repetitive, mass-based interventions
		Risk-based control and feedback mechanisms	Limited adaptability and precision

Component	Core Focus	Key Analytical Dimensions	Indicators of Systemic Weakness
Datu Culture	Collective values and internalized norms	Shared values, trust, and responsibility	Programs perceived as externally imposed
		Perceptions of ownership and collective interest	Situational compliance and participation
		Internalization of rules and norms	Dependence on enforcement pressure
		Social discipline and participation	Temporary success that collapses when oversight weakens

4. Results and Discussion

Five interdependent institutional domains shaping program sustainability are conceptualized, namely legal arrangements, human integrity, financial governance, infrastructure reliability, and culture. The following subsections describe how each domain contributes to systemic stability or fragility.

4.1 Legal Arrangements: Beyond Procedural Compliance

Legal arrangements serve as the primary "anchor" for systemic stability. Programs may achieve high performance under intensive oversight, yet this represents procedural compliance rather than institutionalized sustainability. When legal frameworks lack perceived legitimacy or consistency, compliance remains situational.

From the PDLF perspective, legal strength is not a function of regulatory volume but of enforcement credibility. If rules are perceived as negotiable, the "Legal *Datu*" weakens, creating a dependency on external surveillance. This suggests that for a program to endure, legal arrangements must transition from being an external constraint to becoming a stable, predictable reference for everyday decision-making.

4.2 Human Integrity: The Internal Driving Force

The framework underscores that human resources are not passive inputs (staffing levels) but active relational agents. Our perspective shows that technical competence alone is a poor predictor of sustainability. Instead, the critical variable is Human Integrity, which is the combination of competence, adaptive capacity, and an internal "driving force."

In many Balinese community-based initiatives, we observe that while technical skills are present, structural disincentives often stifle "program champions." When integrity is not rewarded, opportunistic behaviour becomes the path of least resistance. The PDLF argues that without this internal driving force, the system lacks the resilience to survive the "post-funding" phase where external incentives typically decline.

4.3 Financial Governance: Strategic Alignment vs. Absorption

A significant insight of this work is the decoupling of budget absorption from program durability. Traditional evaluation often equates high expenditure with success. However, applying the PDLF lens to infrastructure and tourism projects in Indonesia indicates that high absorption without strategic alignment often reinforces inefficiencies (Handoko et al., 2025).

Financial strength in this framework is defined by transparency and accountability. Weak financial governance does more than just waste resources; it erodes institutional trust, creating a "leak" in the system that prevents the emergence of collective ownership. Therefore, financial inputs only contribute to sustainability when they are strictly aligned with long-term operational goals rather than short-term spending targets.

Issues such as corruption among public officials can also be interpreted within this framework. Rather than treating corruption as an independent variable, the PDLF perspective views it as a manifestation of misalignment across key institutional domains, particularly Human Integrity and Financial Governance. When legal legitimacy is weak and financial governance lacks transparency, opportunistic behaviour may become structurally tolerated rather than individually exceptional, undermining institutional trust and weakening the conditions necessary for sustainable program implementation.

4.4 Infrastructure: The Multiplier of Capacity

Infrastructure is often misidentified solely as physical assets. The PDLF redefines it as Enabling Capacity, which includes "soft" infrastructure such as data flows, feedback loops, and decision-support systems.

In our perspective, various programs frequently invest in visible physical assets (e.g., laboratory equipment or facilities) while neglecting the information systems required to utilize them. Technically adequate infrastructure often fails to support sustainability because it is not integrated into responsive decision-making. Infrastructure only becomes a "*Datu*" (source of strength) when it enables informed, adaptive action rather than just providing an operational presence.

4.5 Culture: The Emergent Outcome of Systemic Coherence

The most pivotal contribution of this framework is the repositioning of Culture as an emergent outcome rather than a causal input. Cultural strength, manifested as trust, shared responsibility, and internalized norms, is the "*taksu*" or the soul of the system that appears only when the other four domains achieve functional alignment. In Balinese understanding, "*taksu*" refers to an inner vitality or life force that gives coherence and authority to an activity (Rudita et al., 2025). Although the term "*taksu*" originates from Balinese tradition to describe the "soul" or internal vitality of a practice, the phenomenon it denotes aligns with the concept of emergent systemic norms and routinized compliance seen in complex adaptive systems and institutional governance literature (Helmke and Levitsky, 2004; Lansing and Kremer, 1993; Ostrom, 2000).

4.6 Analytical Case Simulations Using the PDLF

The following cases are presented as analytical simulations illustrating how the PDLF interprets different configurations of institutional alignment and misalignment. A supplementary PDLF-based program evaluation sheet for the cases is provided in the Supplementary Material.

Case 1. Rabies Control Program (Bali)

The rabies control program simulation demonstrates strong legal foundations at the regulatory level and adequate human technical capacity, particularly in field operations and communication. However, weak enforcement, limited governance effectiveness, and low perceived legitimacy undermine legal coherence. Financial governance and physical infrastructure show consistently low performance, with particular weaknesses in accountability, long-term alignment, and risk-based feedback mechanisms. Cultural dimensions related to ownership, rule internalization, and social discipline remain weak, reflecting limited systemic trust and compliance. Under the non-compensatory logic of PDLF, multiple Datu elements scoring below the threshold indicate that the program remains structurally unsustainable despite technical and regulatory strengths.

Case 2. Sea Turtle Conservation and Ecotourism (Perancak, Bali)

The sea turtle conservation and ecotourism program in Perancak, Bali represents a case of sustained institutional performance under the PDLF perspective. The program demonstrates strong alignment across all five institutional domains, with no element falling below the minimum sustainability threshold.

Legal arrangements are well established, supported by clear regulatory frameworks and relatively consistent enforcement, contributing to moderate institutional stability. Human resources emerge as a key strength, characterized by high technical competence, strong local leadership, and effective community engagement. Financial governance, while modest in scale, shows sufficient alignment with program objectives through diversified sources such as government support, corporate social responsibility (CSR), and community-based mechanisms such as turtle nest adoption. This dynamic is illustrated in Figure 3, where conservation practices are both transmitted through direct engagement and reinforced through participatory mechanisms such as turtle nest adoption, linking community interaction with financial contribution.

Figure 3. Sustainable community-based turtle conservation practices in Perancak, Bali. It is illustrating knowledge transmission through direct engagement between local actors and visitors (left), and participatory nest adoption as a mechanism linking conservation activities with collective ownership and financial support (right) (Source: Kurma Asih Sea Turtle Conservation, Perancak, Bali; Anggara et al., 2024).

Infrastructure conditions are adequate and functionally aligned with operational needs, including both physical facilities and basic monitoring systems. Most critically, cultural dimensions exhibit strong performance, reflected in high levels of public support, collective ownership, internalization of conservation norms, and active community participation. Community-based mechanisms such as turtle nest adoption further reinforce this alignment by integrating financial support with social engagement, where visitors and local actors actively participate in conservation practices. This interaction transforms conservation from a program-driven activity into a socially embedded practice, strengthening long-term sustainability.

Under the non-compensatory logic of the PDLF, the absence of weak domains allows the program to maintain systemic coherence. Sustainability in this case is not driven by any single dominant factor, but by the balanced alignment of legal, human, financial, infrastructural, and cultural conditions, enabling the program to persist beyond external intervention and evolve as a locally embedded institutional practice.

Case 3. Community-Based Waste Management Program

The waste management program shows relatively strong regulatory existence but weak enforcement and governance effectiveness, resulting in partial legal coherence (Figure 4). Human resource capacity is uneven, with good alignment between formal knowledge and operational realities but low integrity and technical consistency. Financial governance performs poorly across all dimensions, indicating structural fragility. Infrastructure availability and maintenance remain limited, constraining operational reliability. Cultural indicators reveal weak collective ownership, low social discipline, and poor norm internalization. According to the PDLF non-compensatory logic, the convergence of weaknesses across legal enforcement, finance, infrastructure, and culture classifies the program as unsustainable despite isolated strengths.

Figure 4. The government is strictly monitoring to prevent open dumping at the landfill in Suwung, Denpasar, installing warning sign (Source: Anak Agung Gede Agung Dalem, 2026)

As reflected in the case simulations, the PDLF conceptualizes program sustainability as an emergent, non-compensatory outcome arising from the alignment of interdependent institutional domains. Rather than evaluating programs based on isolated performance indicators, the framework emphasizes systemic coherence as the key determinant of long-term durability.

The analytical case simulations consistently demonstrate that sustainability is not determined by the strength of any single institutional domain, but by the alignment across all domains. Across the three cases, programs exhibit varying degrees of strength in specific areas—such as technical capacity in the rabies control program or strong social engagement in the sea turtle ecotourism initiative. However, these localized strengths do not translate into long-term sustainability when other foundational domains remain weak. This confirms the non-compensatory logic of the PDLF, namely institutional imbalance, rather than isolated deficiencies, is the primary source of fragility. The second case is informed by a documented ecotourism initiative at Perancak Beach (Anggara et al., 2024), which has demonstrated sustained community-based conservation practices and institutional continuity.

A second pattern emerging from the cases is the distinction between performance under supervision and sustainability under autonomy. Programs tend to perform effectively during periods of intensive external oversight, funding, or coordination. However, once these external supports diminish, underlying weaknesses in legal legitimacy, financial governance, and internalized norms become more visible. This transition reveals that many programs are structurally dependent on external control rather than being internally stabilized systems. The cases therefore reinforce the argument that sustainability requires institutional internalization rather than procedural compliance.

The cases also highlight the critical role of culture as an emergent outcome rather than an independent driver. In contexts where legal arrangements are inconsistently enforced, financial governance lacks transparency, or human integrity is compromised, collective norms such as trust, ownership, and discipline fail to develop. Conversely, even in cases with strong community engagement, such as the sea turtle ecotourism program, sustainability remains fragile when legal authority and financial systems are weak. This suggests that culture cannot be engineered directly; it emerges only when other institutional conditions achieve functional coherence.

Finally, the cases demonstrate that conventional evaluation frameworks may systematically overlook these dynamics. By focusing on measurable outputs—such as budget absorption, infrastructure delivery, or participation rates—traditional approaches fail to capture the underlying institutional alignment required for sustainability. The PDLF, in contrast, provides an analytical lens that reveals these hidden structural conditions, offering a more comprehensive understanding of why programs succeed temporarily but fail to endure over time.

These analytical patterns are not confined to the simulated cases but are also reflected in empirical observations across broader institutional contexts. The diagnostic utility of the framework is evident when analysing modern bureaucratic programs in Bali, which frequently demonstrate strong technical outputs but weak long-term continuity. A paper has analysed Bali-based waste management and renewable energy initiatives which demonstrate high budget absorption and physical asset readiness (Infrastructure and Finance). However, sustainability remains elusive because the "Legal *Datu*" (regulatory consistency at the village level) and the "Human *Datu*" (internal driving forces among local operators) are often misaligned (Dalem et al., 2026; Rusadi et al., 2026).

These cases do not constitute primary empirical investigations; rather, they are constructed as analytical simulations based on documented patterns in the literature and institutional observations. Their purpose is to demonstrate how the PDLF interprets different configurations of institutional alignment and misalignment across contexts. Accordingly, this study does not aim to provide definitive empirical evaluation of specific programs. Instead, it offers a conceptual framework and an illustrative analytical application intended to guide future empirical research on program sustainability across diverse governance settings.

Balinese institutional systems such as *Subak* provide a concrete illustration of this logic. Collective action in Subak does not emerge from externally imposed cultural interventions, but from the alignment of regulatory clarity, shared responsibility, credible resource governance, and supporting infrastructure. In this context, sustainability is not actively engineered as an independent variable, but emerges as a systemic condition when foundational institutional elements operate in balance. Conversely, attempts to introduce cultural components without addressing legal or financial misalignment tend to produce only superficial compliance rather than durable institutional outcomes.

The non-compensatory logic underlying the PDLF further explains why such outcomes occur. Institutional strength cannot be achieved through substitution, where excess in one domain compensates for weakness in another. Instead, sustainability depends on the completeness and alignment of all foundational elements. When one domain is structurally weak, the system remains fragile regardless of strengths elsewhere, reinforcing the view that sustainability is a condition of systemic integrity rather than aggregated performance.

The importance of motivation as a determinant of the cultural domain within the PDLF is also evident across broader policy contexts. Large-scale programs tend to achieve more sustained outcomes when objectives align with perceived socio-economic priorities and collective needs, strengthening individual and collective motivation over time (Araújo et al., 2024; Smyth, 1991). Similarly, crisis responses such as the COVID-19 pandemic illustrate how shared risk perception can rapidly mobilize compliance and participation, even in the absence of prolonged external enforcement (Güner et al., 2021; Kargi and Coccia, 2025; Rancati et al., 2025). These patterns suggest that culture emerges from aligned incentives, legitimacy, and shared understanding, rather than from normative prescriptions alone.

From this perspective, enforcement and compliance must be reconsidered in relation to institutional readiness. In many contexts, compliance does not emerge automatically from policy design or normative expectations, but is initially established through consistent enforcement mechanisms (Koops, 2014; Tallberg, 2002; Weske et al., 2018; Mavrouli, 2025). In Indonesia and comparable governance settings, however, enforcement is often uneven or inconsistently applied (Ching et al., 2025; Nelson, 2023; Prameela and Sundaram, 2024; Prasojo, 2025), resulting in compliance that remains situational rather than internalized.

These conditions suggest that expectations of voluntary compliance without adequate enforcement are frequently premature. In the absence of regulatory consistency, credible incentives, and aligned institutional conditions, behavioural change is unlikely to be sustained. Lessons drawn from contexts where compliance appears self-regulating should therefore be interpreted cautiously, as such outcomes are typically preceded by strong and consistent enforcement phases. Within the PDLF perspective, enforcement is not opposed to sustainability; rather, it functions as a transitional mechanism. Sustainable compliance emerges only when enforcement is gradually internalized into routines, incentives, and shared norms through systemic institutional alignment.

5. Conclusion

This study introduces the PDLF as a systemic departure from fragmented, compliance-driven evaluation. By integrating legal, human, financial, infrastructural, and cultural dimensions into a unified, non-compensatory model, the framework provides a robust tool for diagnosing program resilience. The core finding is that sustainability is an emergent outcome: it cannot be "added" to a program through socialization or more funding, but must arise from the functional integrity of its foundational pillars.

For policymakers and evaluators, this implies that the human integrity and internal driving forces must be supported by credible legal and financial architectures. Future research should empirically test this framework's diagnostic power in "post-intervention" phases across different sectors to further refine the weights of each *Datu* in various institutional contexts.

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