

From Interaction to Institution: Collective Learning and Governance Foundations in a Biosphere Reserve

Nabila Rachma*, Pri Hermawan, and Utomo Sarjono Putro

School of Business and Management, Institut Teknologi Bandung, West Java, Bandung, Indonesia

Abstract—Biosphere Reserves are designed to integrate conservation, development, and knowledge generation through coordinated multi-actor governance—yet how the conditions for that coordination come to exist remains undertheorized, both in BR scholarship and in organizational learning literature more broadly. This gap is particularly consequential for Raja Ampat, designated a UNESCO Biosphere Reserve in September 2025, whose formal governing body had not yet been constituted at the time of this study. Drawing on semi-structured interviews with two purposively selected community actors—one representing inland forest governance in Kabupaten Sorong, one representing coastal reef-mangrove governance in Kabupaten Raja Ampat—this study applies thematic analysis with Ostrom's Social-Ecological Systems framework as sensitizing concepts. Four themes emerged consistently across both informants: trust-building, intergenerational knowledge transfer, knowledge-to-rule conversion, and collective action as coordination infrastructure. These are not outcomes of governance design—they are its preconditions, offering community development practitioners and BR governance designers a grounded account of what must be recognized, not built, before institutional frameworks take shape.

Keywords—biosphere reserve governance; organizational learning; social-ecological systems; community development; collective action; Raja Ampat

I. INTRODUCTION

Biosphere Reserves (BRs) are among the most ambitious governance experiments in contemporary conservation: unlike conventional protected areas, they are designed to integrate biodiversity conservation, sustainable development, and knowledge generation within a single, coordinated multi-actor framework [1], [2]. Meeting this mandate is, at its core, an organizational learning problem—it requires diverse actors, holding different knowledge systems and different relationships to the same landscape, to develop shared understanding and coordinate collective action. Yet the question of how such shared understanding and coordination capacity actually come to exist has received considerably less scholarly attention than the ambition itself.

The gap sits at the level of design assumptions. BR governance scholarship has examined coordination extensively, but predominantly as a contextual

condition—something that emerges when the right actors and relational histories happen to be present, rather than something that can be deliberately built [3], [4], [5]. This leaves BR governance structurally contingent, dependent on relational conditions no framework can guarantee. What remains undertheorized is the question prior to coordination: what foundational conditions must exist before governance arrangements can function at all, and how do those conditions come to exist?

This question is particularly consequential for Raja Ampat. Designated a UNESCO Biosphere Reserve in September 2025, Raja Ampat is entering its governance formation period at a moment of unusual significance: its formal governing body had not yet been constituted at the time of this study. This pre-institutional window means that what gets built into the governance architecture now—and what gets bypassed—will shape coordination and collective action in this landscape for decades. Yet the actors who have sustained governance practice here for years—community leaders, patrol members, homestay owners, adat knowledge holders—have not waited for formal institutions. They have been building the foundations already.

This study examines how those foundations work. Drawing on semi-structured interviews with two purposively selected community actors—representing different ecosystems, administrative jurisdictions, and governance positions within the same BR landscape—we ask: how do diverse actors experience, interpret, and enact governance practice, and how do these enactments shape patterns of coordination? Using thematic analysis [6] with Ostrom's [7] Social-Ecological Systems (SES) framework as sensitizing concepts, we trace governance patterns that emerged from community practice prior to any formal institutional design.

These findings speak beyond conservation governance scholarship. For community development practitioners working at newly designated or forming BRs, the four patterns identified here offer a practical diagnostic: what a landscape already has, before any governance framework is designed on top of it. More broadly, they contribute to organizational learning literature: an empirical case of learning capacity that formed entirely outside formal institutional design, in a setting central to the sustainability agendas most global institutions now claim to pursue. The question this raises extends beyond conservation—whether existing learning capacity should be assumed, or deliberately recognized and built upon.

*Corresponding Author: nabila.rachma25@gmail.com

Following established guidance on structuring management scholarship [8], the remainder of this paper proceeds as follows. Section II details the methods. Section III presents findings from two informants representing distinct ecological and actor positions within the Raja Ampat BR landscape. Section IV discusses these findings against Ostrom's SES framework and their implications for governance design. Section V concludes.

II. METHODS

This study adopts an interpretivist, abductive research approach [9], moving iteratively between empirical material and theoretical frameworks rather than testing pre-formed hypotheses. The research design is a single case study [10] of the Raja Ampat Biosphere Reserve, selected for analytical depth: Raja Ampat received UNESCO BR designation in September 2025, and its formal governing body had not yet been constituted at the time of this study—a pre-institutional condition that enables examination of governance preconditions before institutional structure is fixed.

Data were collected through semi-structured interviews with two purposively selected informants occupying contrasting positions within the same BR landscape: Menase Fami, Kepala Kampung Malasigi (Suku Moi, Kabupaten Sorong), representing inland forest governance (approx. 62 minutes); and Regina Lapon, a Pokdarwis member and homestay owner (Suku Ambel, Kabupaten Raja Ampat), representing coastal reef-mangrove governance (approx. 40 minutes). This pairing was deliberate: convergence of findings across such distinct ecological, administrative, and actor positions strengthens the analytical defensibility of the results.

Data were analyzed using thematic analysis [6], with Ostrom's [7] SES framework applied as sensitizing concepts to recognize and name governance patterns as they emerged, without predetermining what those patterns would be.

The researcher holds dual positionality as a doctoral candidate and as a community development consultant for Fauna & Flora Indonesia (FFI) at the same field site, with both informants known prior to this study through prior conservation and community-development fieldwork, including work later documented in an account of local conservation champions in the region [11]. This insider position enabled a depth of access an outside researcher would be unlikely to obtain, and is treated here as an analytical asset rather than a limitation. Trustworthiness follows the framework of Lincoln and Guba [12]: credibility through prolonged field engagement, dependability through a documented analytic decision trail, and confirmability through explicit positionality declaration alongside verbatim evidence.

III. RESULTS

Two informants—Menase Fami, Kepala Kampung Malasigi, representing inland forest governance in Kabupaten Sorong, and Regina Lapon, a Pokdarwis member and homestay owner, representing coastal reef-mangrove governance in Kabupaten Raja Ampat—yielded four convergent governance patterns, despite

differing ecosystems, administrative jurisdictions, and sources of authority: Menase Fami's authority is rooted in adat marga and the formal Kepala Kampung role; Regina Lapon's is earned entirely through demonstrated commitment over eight years. That the same four patterns appear across such distinct positions suggests they are not artifacts of individual character, but a consistent underlying structure through which governance operates in this landscape.

Trust-building as governance prerequisite. For both informants, trust precedes and enables every subsequent governance interaction. In Malasigi, the entry of external actors—including NGOs and government—was mediated through existing adat bonds, with a family member serving as relational guarantee before any formal partnership was agreed. In Kalisade, Regina Lapon describes years of sustained restraint under community suspicion and family resistance:

"Awal-awal juga waktu pertama kali jalan dengan FFI juga banyak ancaman masuk... Menghadapi orang itu harus sabar. Akhirnya lama-lama dia juga bersabar." ("In the early days working with FFI there were many threats... You have to be patient with people. Eventually, they became patient too.")

Trust here is not institutionally bestowed—it is earned through years of visible, consistent practice.

Intergenerational knowledge transfer. In both cases, governance knowledge is transmitted through embodied practice rather than documentation. In Malasigi, children participate in SMART Patrol and ritual performance, learning territorial knowledge by walking, not reading. In Kalisade, Regina Lapon frames this transfer as an obligation running in two directions—backward accountability, forward commitment:

"Mama punya mimpi ini, Mama mau kasih sekolah Charles di (Sekolah) Kehutanan biar dia ke depan bisa perhatikan alam yang ada ini." ("Mama has this dream—Mama wants to send Charles to Forestry School so that he can look after this nature going forward.")

Knowledge-to-rule conversion. The clearest instance is Belempe, a hot spring historically accessible only to Moi adat elders. As ecotourism developed, this sacred knowledge was not displaced but converted into an operational rule—a morning briefing SOP delivered to every guest:

"Wanita dilarang kalau dapat haid jangan sambil masuk ke sumber air panas... Karena pantangan-pantangan ini kami tidak mau terjadi sesuatu macam-macam terjadi kepada tamu." ("Women who are menstruating are not permitted to enter the hot spring... we do not want anything to happen to our guests.")

Tacit cosmological knowledge became an operational rule without losing its substantive content—a pattern of knowledge conversion also visible in Regina Lapon's shift from firsthand experience in extractive mining to codified conservation practice.

Collective action as coordination infrastructure. In Malasigi, this appears as a deliberate structural separation—LPHK for forest and government relations, Pokdarwis for ecotourism—operating alongside an external network (FFI, Kasuari, Pertamina, UNIMUDA) rather than under it. In Kalisade, Regina Lapon selects partners and patrol members by character rather than formal procedure, with FFI functioning as an external accountability partner:

"Jadi bukan Mama sendiri yang nanti... Lihat dan nilai. Tapi dari pihak kantor (FFI) juga." ("So it won't only be

Mama who watches and evaluates. The office—FFI—will also.”)

Both informants also named a shared constraint: infrastructure. For Menase Fami, this is a hard limit—fifty booked guests failed to reach Malasigi due to road conditions. For Regina Lapon, it is gradual—limited boat access and homestay capacity bound, rather than block, what community governance can achieve.

IV. DISCUSSION

Mapped against Ostrom's [7] SES diagnostic framework, the four themes above reveal a coherent pattern: each corresponds to governance system variables whose presence—not design—determines whether collective action can function at all.

Trust-building maps onto U6 (norms and social capital) and U5 (leadership). Both informants' accounts show trust as the condition that makes governance interaction possible, not a relational bonus governance can work around. U6 and U5 are not variables governance design can install; they are what governance design assumes is already there.

Intergenerational knowledge transfer maps onto U7 (knowledge of SES) and U3 (history of use). This knowledge lives in bodies, in walking, in ritual participation—not in documents or training programs. U7, in this context, accumulates across generations through practice, and it is precisely that accumulation that makes it durable.

Knowledge-to-rule conversion maps onto GS5 and GS6 (operational and collective-choice rules). Viewed through Nonaka and Takeuchi's [13] SECI lens, the Belempé case is internalization in its fullest sense: codified knowledge embedded in shared practice so thoroughly that it no longer requires articulation. What GS5 and GS6 describe as governance rules are, here, the formalized residue of a knowledge-conversion process the SES framework can locate but not itself explain—which is why the two frameworks are complementary rather than redundant.

Collective action as coordination infrastructure maps onto GS3 (network structure) and I3 (deliberation processes). Coordination functions not because a governance structure compels it, but because a sufficient density of trust and shared understanding has accumulated across the actor network.

Taken together, these mappings reveal what the SES framework makes analytically visible but does not itself theorize: the governance system variables it identifies as conditions for collective action success are not outputs of institutional design. They are inputs. In Raja Ampat, they were built—slowly, relationally, through practice—by community actors operating long before any BR governance framework existed. This reframes the design question for newly designated BRs, and for organizational learning more broadly: not how institutions build learning capacity from scratch, but how they recognize and incorporate learning capacity that communities have already built, before institutional lock-in occurs. For community development practice specifically, this suggests that landscape diagnostics should treat existing relational and knowledge infrastructure as an asset to design around, not a gap to be filled.

V. CONCLUSION

This study examined how diverse actors experience, interpret, and enact governance practice in the Raja Ampat Biosphere Reserve, and how these enactments shape coordination. The findings offer a direct answer: governance in this landscape operates through four consistently enacted patterns—trust built through sustained relational work, knowledge transmitted across generations through embodied practice, local knowledge converted into operational rules, and collective action sustained through relational networks rather than formal hierarchy. These patterns were not produced by governance design; they were built by community actors over years, prior to and independent of any formal institutional framework.

The practical implication is most immediate for Raja Ampat itself. With its formal governing body not yet constituted at the time of this study, the BR sits in a pre-institutional window where foundational design choices carry the highest consequence. What these actors have built—trust networks, intergenerational knowledge systems, practice-embedded rules, relational coordination infrastructure—represents a governance foundation that any formal arrangement will either build on or bypass. For community development practitioners working in comparable pre-institutional settings, this suggests the design task is less about building institutional frameworks quickly, and more about ensuring that what communities have already constructed is recognized and deliberately incorporated before it is.

This study is limited to two purposively selected informants and does not represent the full actor diversity of the Raja Ampat BR landscape; its findings support analytical, not statistical, generalization. Future research would benefit from broader actor coverage—including government, NGO, and private-sector actors—and from longitudinal follow-up as the formal governing body takes shape.

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