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Industrial Development in Protected Zones: A Four-Gate Legal Assessment of the Tahura Ngurah Rai Factory Case in Bali

Ketut Salsa Hera Antrozia

Faculty of Law, Universitas Warmadewa, Denpasar 80235, Indonesia

ABSTRACT: The reported construction-material factory linked to Russian investment near Bali's Tahura Ngurah Rai highlights a recurring difficulty in environmental governance: the coexistence of land certificates, business registrations, spatial restrictions and conservation boundaries. This article examines the legal consequences of that overlap through normative legal research using statutory, conceptual and documentary case approaches. The analysis considers the September 2025 inspection and follow-up reporting, the 2023-2043 Bali spatial plan, the 2024 conservation-law amendment and the risk-based licensing regulation enacted in 2025. A four-gate legality test is proposed, requiring separate examination of conservation status, land tenure, spatial conformity and environmental and business authorizations. Public reporting supports the existence of a disputed site and temporary enforcement measures; it does not establish a final court judgment, the definitive status of each certificate or quantified ecological harm. A lease or OSS record cannot independently authorize manufacturing on land whose governing legal designation prohibits that use. Effective enforcement depends on geospatial verification, coordinated documentary review, reasoned interim measures and scientifically supported restoration where harm is demonstrated. The resulting framework links investment certainty to enforceable coastal conservation without treating nationality as a substitute for a legal element.

KEYWORDS: Conservation Forest; Environmental Approval; Industrial Licensing; Land Tenure; Mangrove; Spatial Conformity

I. INTRODUCTION

The proposed construction-material factory discovered in the mangrove landscape of Bali poses a narrow legal question with unusually wide consequences. What makes an industrial facility lawful when its physical site overlaps land designated for conservation? The answer cannot be inferred from a company registration, a tax number, an investor's nationality, or an apparently valid land certificate. Indonesian law regulates each of those matters through a different institution. Forest designation, title registration, spatial conformity, environmental approval, business licensing, and operating oversight have their own legal tests. A development may satisfy one test while failing another. The reported factory at Tahura Ngurah Rai offers an opportunity to explain how those tests should operate together.

The issue became public after a site inspection conducted by the Bali Provincial Legislative Council's Special Committee on Spatial Planning, Assets and Licensing (Pansus TRAP) on 17 September 2025. News coverage described a construction-material manufacturing facility connected with Russian investment near the mangrove and grand forest park landscape in Sidakarya, Denpasar. Subsequent reporting identified the company as EcoCrete. In a 23 September 2025 meeting, the committee requested documentation from the park administration, the provincial land office, and the Civil Service Police Unit (Satpol PP). ANTARA reported that the enterprise occupied approximately 1.4 hectares under a twenty-year lease from four local certificate holders; information presented to the committee described seven foreign shareholders and one Indonesian shareholder [17]. Those details are reported findings, not determinations by a court.

The September chronology matters. An earlier draft of this topic referred to media reports in 2024, yet the identifiable inspection and follow-up coverage relate to September 2025 [17]-[19]. Reporting described a temporary sealing of the facility while officials reviewed incomplete permitting documentation. Neither the media accounts examined here nor the legal materials available for this study establish a final judicial decision against the operator, a completed cadastral adjudication, or the precise ecological loss at the site. A sound legal analysis must keep those gaps visible. A temporary administrative restriction establishes that authorities intervened. It does not, by itself, settle every disputed element of liability.

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Tahura Ngurah Rai is not simply undeveloped land awaiting private investment. The forest and mangrove landscape forms part of southern Bali's coastal ecological infrastructure. Its vegetation, tidal connections, substrate, and waterways perform functions that ordinary industrial plots cannot replicate at will. Research on mangroves links ecosystem integrity with shoreline stability, habitat provision, sediment dynamics, and climate adaptation [1]-[3]. These ecological functions help explain why Indonesian spatial and conservation rules distinguish protective uses from activities requiring fundamental land conversion. Ecological sensitivity makes a location legally important; it does not dispense with the need to identify its precise cadastral and forest boundaries.

Rapid licensing reform sharpens the problem. The Online Single Submission system, now governed principally by Government Regulation No. 28 of 2025 for risk-based business licensing, is designed to standardize entry into lawful business activity [15]. Its digital workflow does not transfer public forest land, amend a regional spatial plan, or replace a required environmental approval. Government Regulation No. 21 of 2021 separately governs spatial administration [12]; Government Regulation No. 22 of 2021 governs environmental approval and impact assessment [13]. Treating the OSS registration screen as conclusive proof of site legality therefore mistakes an administrative interface for the full body of public law.

The conflict is frequently portrayed as a contest between environmental protection and foreign investment. Such framing obscures the central legal issue. Indonesian investment law offers channels for foreign-capital enterprises, subject to licensing and sectoral requirements. Foreign ownership of company shares differs from a foreign individual's ownership of freehold land. A lawful investment company may lease private land, yet the lease confers no exemption from restrictions attached to forest designation or spatial planning. A domestic company would face the same location-based limits. The relevant legal problem is regulatory coherence, not the passport of an individual associated with the business.

Land certificates introduce a separate dimension of uncertainty. A certificate ordinarily carries evidentiary weight under Indonesia's land-registration system. It is not a universal authorization to use the property for any purpose. The certificate's type, underlying cadastral map, original issuance file, location, encumbrances, and relation to a legally designated forest boundary must be examined. ANTARA reported that the committee requested a review of certificates allegedly overlapping the park landscape [17]. A reported overlap is a reason for a technical and administrative audit. It should not be converted into a declaration that every title in the vicinity is automatically void.

The original contribution of this article is a sequential, evidence-sensitive legality assessment. Four gates must be examined: legally established forest and conservation status; valid land tenure; compatibility with operative spatial plans; environmental approval together with sectoral and business permissions. A failure at one gate cannot ordinarily be cured merely by producing evidence from another. If location status is disputed, competent agencies must first reconcile georeferenced maps and formal designation records. If an environmental instrument is missing, the decision-maker must identify whether the activity is legally eligible for assessment in that location before asking what form of study should be prepared. This framework separates administrative irregularity from proven environmental harm, criminal culpability, and civil compensation.

The article asks three questions. Which statutory instruments regulate a manufacturing facility alleged to occupy part of Tahura Ngurah Rai? What evidentiary sequence should authorities follow when land certificates, forest maps, spatial plans, and licensing data appear to conflict? How should administrative control, possible judicial review, environmental restoration, and public accountability interact without prejudging contested facts? These questions are addressed through doctrinal analysis of primary legal materials, verified government publications, ecological scholarship, and identifiable news reports. The discussion uses a 24 September 2026 legal reference date; later changes would require a fresh legislative and case-record review.

An institutional account is preferable to a single-permit account for another reason: legal instruments can differ in the information they certify. A land certificate records a particular land right. Spatial conformity addresses the compatibility of an intended use with binding plans. Environmental approval concerns assessed impacts and specified management obligations. An OSS record relates to business legality under its own regulatory framework. Each instrument answers a question; none can be assumed to answer all the others. The analytical task is to identify which decision must be made first when one record appears to contradict another. That task becomes urgent when construction is already complete and public authorities have issued signals that may have encouraged private investment.

This paper deliberately separates the factual chronology from the applicable law at each point in time. A report published after an inspection may describe the regulator's current position, while the legality of an earlier application may depend on the rule in force when the application was lodged. An enforcement decision made in 2025 may be governed by a different administrative instrument from a certificate issued many years before it. Temporal accuracy does not require abandoning current conservation

obligations. It requires naming the legal instrument that applies to each transaction and explaining the consequence of its amendment or repeal. This approach reduces retrospective oversimplification.

II. RESEARCH METHOD

This article uses normative or doctrinal legal research. The object of analysis is the relationship among legally binding rules rather than the measurement of physical conditions through new fieldwork. Three approaches structure the inquiry: a statute approach to map operative legal duties; a conceptual approach to distinguish overlapping forms of legality and responsibility; and a case-oriented documentary approach to test the framework against the reported Tahura Ngurah Rai dispute. Case-oriented analysis here does not mean that the author interviewed witnesses, examined confidential licensing files, or independently surveyed the factory footprint. Its factual basis is expressly limited to public reporting and official legal instruments.

Primary materials include the 1945 Constitution, the Basic Agrarian Law, legislation on conservation, forestry, spatial planning and environmental management, the Job Creation legislative framework, Government Regulations Nos. 18, 21, 22 and 23 of 2021, Government Regulation No. 28 of 2025, and Bali Provincial Regulation No. 2 of 2023 [4]-[16]. These instruments are read according to their legal hierarchy and temporal application. A repealed rule is not treated as current merely because it appears in an earlier article. For example, the 2009 Bali spatial plan has been superseded by the 2023-2043 provincial plan, while the risk-based licensing regulation of 2021 was replaced in June 2025 [15], [16]. The conservation statute is considered alongside its 2024 amendment [5].

Secondary materials are used for two distinct purposes. Peer-reviewed research explains the ecological significance of mangrove ecosystems; it does not prove that a particular factory damaged a measured area [1]-[3]. Media reports document the publicly reported inspection, statements by elected officials, the company's reported ownership structure, and the temporary enforcement response [17]-[20]. News sources are cross-checked where possible. Official maps, title dossiers, approved environmental documents, complete OSS records, laboratory measurements, and court judgments were not available in the provided source manuscript. No inference of their contents is made. The absence of a document from public reporting is not equivalent to legal proof that the document has never existed.

Legal materials were organized into a sequence that mirrors the decisions an agency would need to make. The first stage asks whether the site lies within formally established forest and conservation boundaries. The second tests the nature and origin of any private land right. The third checks the zoning and spatial-conformity pathway. The fourth reviews environmental approval, technical requirements, and business licensing. A fifth, remedial stage identifies possible administrative, civil, or criminal consequences only after the predicate facts and relevant legal provisions have been established. The stages are analytical, not a claim that Indonesian agencies must operate in a single fixed bureaucratic order in every file.

The analysis applies a disciplined standard for attributing claims. A newspaper's quotation of a committee member is described as an allegation or reported finding. A regulatory requirement stated in an official legal instrument is described as a legal norm. The author's conclusions address the consequences that would follow if specified facts were substantiated. This conditional method is important in a case involving unsettled boundary and certificate questions. It also prevents the conflation of a lawful order to suspend operations with a criminal conviction or an expert determination of ecological loss.

The legal reference date is particularly important because the source manuscript predates or overlooks several material changes. The 2023 Bali plan replaced its 2009 predecessor; a 2024 amendment revised Indonesia's foundational conservation statute; the government's 2025 licensing regulation superseded the 2021 licensing instrument [5], [15], [16]. The analysis treats those changes as central rather than editorial updates. Earlier provisions are discussed only when they explain the history of a certificate, authorization, or alleged event. Where a statutory provision has been altered, this paper avoids assigning a penalty by reproducing text from an older version without confirmation that it applies to the relevant conduct.

Source criticism was applied to the reported chronology. The committee inspection is associated with 17 September 2025 in contemporaneous coverage, while follow-up interviews and reports appeared over the ensuing week [17]-[20]. Press accounts vary in how they describe the ownership, land status, and scope of alleged noncompliance. The most detailed agency-meeting report was used for the reported lease and shareholding details [17]. More emphatic descriptions elsewhere are not treated as official adjudications. News media have evidentiary value as records of what was publicly alleged, inspected, or said. They are not replacements for signed permits, certified land records, scientific surveys, or judgments.

III. RESULTS AND DISCUSSION

A. Conservation Status Is a Question of Law and Mapped Boundaries

Indonesia's legal framework contains several types of protected territory. The designation of a conservation forest, the protective zoning of a provincial spatial plan, and a coastal-mangrove designation are related but not interchangeable. Law No. 5 of 1990, as amended by Law No. 32 of 2024, provides the core framework for conserving living natural resources and ecosystems [5]. Law No. 41 of 1999, read together with later amendments, provides forestry rules concerning forest functions, administration, and permitted uses [6]. These statutes should be interpreted with the detailed implementing arrangements under Government Regulation No. 23 of 2021 [14]. An agency cannot resolve competing maps simply by choosing the one that is most convenient for a proposed investor.

The term taman hutan raya designates a form of nature-conservation area. Its legitimate purposes include ecosystem preservation and regulated use consistent with its conservation function. A facility that manufactures construction materials is not automatically compatible with those purposes merely because its products are described as environmentally friendly. Product attributes concern the output of an enterprise; land-use legality concerns the effect and permissibility of its location. A claimant asserting an exceptional legal pathway must identify the particular authorization, the body competent to issue it, the governing exception, and the activity for which it was granted. Generic assertions of public benefit cannot displace a legally designated conservation function.

Protected-area classification requires documentary precision. Authorities should obtain the formal designation decision, its annexed coordinates, any subsequent boundary-demarcation records, the cadastral parcel map, and current geospatial data. The mapped industrial footprint should include buildings, storage, vehicle access, fill material, drainage structures, and any adjoining operational area. This matters when an administrative news report describes a facility as 'in the Tahura' while the company or titleholder may contest the boundary. An exact overlay, backed by field verification and a documented coordinate system, can distinguish a site genuinely inside a protected unit from one adjacent to its perimeter. The latter may still trigger environmental scrutiny; it poses a different threshold question.

The reported presence of mangrove vegetation offers evidence of ecological sensitivity, not a substitute for formal boundary records. Conversely, the absence of standing trees on an already filled parcel does not establish that a conservation designation has ceased to apply. An unlawfully cleared site may remain protected even after its vegetation has disappeared. Where the legal map and on-site conditions diverge, the mismatch should prompt investigation into historical conversion rather than an assumption that the map is obsolete. This is especially important in coastal settings where the physical landscape changes through sedimentation, reclamation, tidal processes, and human construction.

Bali's operative regional spatial instrument is Provincial Regulation No. 2 of 2023 on the 2023-2043 Regional Spatial Plan [16]. The earlier 2009 regulation, used as a principal reference in the source manuscript, was expressly superseded. The present plan supplies provincial spatial classifications and policies; a site-specific assessment may also require the applicable municipal spatial or detailed spatial plan. Legal certainty depends on identifying the correct territorial level and legally applicable version of each map. The mere invocation of a 'Bali RTRW' does not replace an examination of the actual zoning designation at the coordinates of the facility.

The distinction between a legal designation and physical condition is important for both enforcement and property rights. Land that has been disturbed by prior activities may appear commercially usable even though its protected designation remains in force. The reverse also occurs: an environmentally valuable stand of vegetation may lie outside a formally protected forest and remain subject to separate spatial or coastal protections. A legal analysis should resist inferring the statutory category solely from an aerial photograph. It should also resist treating a contested certificate as enough to establish that a public forest boundary is wrong. Both evidence types belong in the same verified geographic reference system.

Forest status must be assessed before using the label 'unauthorized forest use'. Indonesian conservation and forestry law contains specific rules about the purposes for which protected or conservation forests may be managed [5], [6], [14]. A legal opinion should identify the relevant category and the exact legal rule, not simply quote a general policy favoring environmental quality. If a site falls within an authorized boundary, the reviewer must ask whether any narrowly defined legal exception covers the actual manufacturing activity. If it lies outside the boundary, the statutory analysis shifts to applicable zoning, coastal safeguards, and environmental screening. A reasoned determination should state which factual branch the evidence supports.

B. Spatial Conformity Must Precede Reliance on an OSS Record

Law No. 26 of 2007 on Spatial Planning, as subsequently amended, distinguishes planning, utilization, control, and supervision of space [7], [10]. Government Regulation No. 21 of 2021 gives operational content to this architecture, including spatial

conformity for proposed economic activity [12]. Location legality is not a routine postscript to commercial registration. It is a substantive question about whether the proposed activity can occupy the proposed site at all. If a binding plan reserves an area for conservation, officials must identify any lawful exception before considering the ordinary conditions of construction or factory operation.

The modern licensing system is often described as 'risk-based', a term that can be misunderstood. A risk classification allocates regulatory scrutiny by business activity and associated hazards. It does not itself rezone land. Government Regulation No. 28 of 2025 replaced Government Regulation No. 5 of 2021 and governs the contemporary risk-based business-licensing framework [15]. An enterprise's business identification number, standard certificate, or business license should therefore be tested against the distinct evidence of land-use compatibility. A record generated through a digital portal may establish that certain information was submitted or certain administrative steps completed. It does not cure a false coordinate, an incorrect business classification, or a missing protected-area authorization.

The sequencing problem becomes acute where forest boundaries and land titles overlap. Suppose a company's OSS record lists an industrial location, its lease identifies a privately certificated parcel, and the forestry authority's map places the same parcel within a conservation forest. Accepting the lease as definitive would disregard forest law. Treating the map as final without checking the underlying designation and cadastral history could also overlook a genuine administrative error. The legally defensible response is a coordinated determination of location status. Subsequent permit review should rely on the reconciled record and state which legal instrument governs any remaining conflict.

Spatial approval also requires attention to project identity. The activity proposed in an application may be categorized as storage or commercial services, while the site contains manufacturing machinery, production waste, chemical inputs, and frequent heavy-vehicle movements. Different operational characteristics can change spatial eligibility, environmental assessment, building requirements, and business licensing. A regulator should compare the permitted activity with evidence of actual operation, including company filings, site plans, equipment inventories, and inspection notes. Whether EcoCrete's declared business activity differed from its actual activity cannot be conclusively established from the available public reports. The possibility warrants record-based verification rather than speculation.

Institutional fragmentation explains how inconsistencies can remain undetected. Land registration is administered through the agrarian and land offices. Forestry authorities maintain forest-status records. Spatial-planning institutions manage zoning and conformity. Environmental agencies assess anticipated impacts and monitor compliance. Investment-licensing authorities record the business undertaking. A digital platform can connect applications while still depending on the accuracy of each agency's underlying data. The practical weakness is not necessarily digitization itself, but an unresolved conflict between databases combined with unclear responsibility for stopping an application when a high-risk overlap is detected.

An agency should also examine the legal quality of the applicant's coordinate information. Errors can arise when an application uses a building's mailing address rather than the operational footprint, copies coordinates from an adjacent parcel, or relies on a preliminary site sketch rather than survey data. The consequences are substantial near narrow conservation boundaries. A facility's main building might appear outside a protected polygon while a storage yard, drainage outlet, or newly filled access route lies inside it. Determining what constitutes the 'project site' requires an integrated site plan and consistent georeferencing of all physically associated activities. Treating only the office address as the location creates an avoidable regulatory blind spot.

The legal sequence should remain intelligible to an applicant. A flagged conflict should produce a notice identifying the relevant protected-area layer and the authority capable of resolving it. The applicant should have a defined opportunity to provide an approved survey, correct a genuine clerical error, or request a formal spatial determination. A system that silently blocks applications without explaining its legal basis risks replacing one form of uncertainty with another. Clear referrals allow responsible enterprises to change location before substantial capital is spent. They also improve enforcement when a business knowingly proceeds after a formally communicated location restriction.

C. Land Certificates, Leases, and Foreign-Capital Investment

A certificate should be evaluated in light of its precise legal character. Indonesia's Basic Agrarian Law reserves hak milik, the strongest private ownership title, to eligible Indonesian persons and entities under statutory conditions [4]. Other land rights, including certain forms available to corporate entities, operate under different requirements. Government Regulation No. 18 of 2021 regulates land rights, management rights, strata title, and land registration [11]. The 2025 media coverage indicates that EcoCrete reportedly leased its site from four local certificate holders rather than holding title in the foreign shareholders' individual names [17]. That distinction materially changes the appropriate legal analysis.

A lease can create enforceable private obligations between parties. It does not expand the lawful use of a parcel or extinguish rights held by the state. If cadastral boundaries overlap a valid conservation designation, officials need the underlying issuance records and historical mapping to decide whether an error occurred, whether the parcel was excluded from forest designation, or whether another legal explanation exists. Each possibility produces different consequences for titleholders, public agencies, and the business tenant. A declaration that a certificate is invalid requires a competent legal process, proper evidence, and protection of affected parties' procedural rights.

The foreign-capital element should be separated from these land questions. The September 2025 reporting described a company with seven foreign participants and one Indonesian participant, not a foreign individual receiving a freehold certificate [17]. The legality of its investment vehicle depends on the actual incorporation, shareholding, sectoral access, capital requirements, and applicable business licenses. The nationality of shareholders does not create an exemption from conservation law; equally, nationality alone is not evidence of a forest-law violation. A legal article should avoid language suggesting that an industrial activity becomes unlawful solely because the investor comes from Russia.

The lease also presents possible questions of contractual risk allocation. If a landlord represented that the premises were lawfully available for industrial use, the tenant may possess contractual remedies depending on the lease, disclosed documents, knowledge of the parties, and governing law. Those private remedies remain distinct from a public agency's authority to halt incompatible activity. An enterprise cannot continue operating in a protected area merely because termination would be commercially costly. Nor should officials prejudge a landlord's liability before reviewing the certificate history and the representations actually made. The proper administrative record should preserve the lease, correspondence, approved drawings, and relevant advertisements or due-diligence materials.

The committee's reported discovery of other overlapping certificates presents a systemic question, yet individual parcels should not be grouped into a single finding of illegality. Parcels can differ in issuance date, mapped location, right type, transfer history, and legal status at the moment of original registration. A geospatial audit could prioritize the EcoCrete footprint while establishing a replicable method for reviewing the wider landscape. Public release of aggregate overlap data would promote accountability. Individual personal information and disputed ownership details should be treated according to applicable disclosure and privacy rules.

A competent examination of tenure would proceed from original records rather than images of the front page of a certificate. Relevant material includes the register, measurements on which the parcel was created, the date and legal basis of issuance, past transactions, recorded restrictions, and any decisions affecting forest designation. A chronological overlay could reveal whether the conflict existed when the title was first issued or arose through later mapping or administrative change. The result determines the nature of the possible remedy. The state may need to correct inconsistent records, examine a defective issuance decision, or recognize a parcel that was never within the protected boundary. These outcomes cannot be chosen merely on the basis of public concern.

D. Environmental Approval Is Conditional on a Permissible Location

Law No. 32 of 2009, read with the amendments incorporated into Law No. 6 of 2023, remains the central environmental protection framework [8], [10]. The current regulatory language distinguishes an environmental approval, including an environmental feasibility decision or approved environmental-management instrument as appropriate, from the former standalone terminology of an 'environmental permit'. Government Regulation No. 22 of 2021 sets out screening, assessment, approval, monitoring, and related enforcement requirements [13]. An analysis based only on the pre-Job Creation version of Article 36 or the former wording of Article 109 would risk misstating the governing legal test.

Location and scale both matter in screening. The implementing framework recognizes that an undertaking situated inside or directly adjacent to a protected area may be required to prepare an environmental impact assessment, subject to the law's specific screening and exemption provisions [13]. An industrial activity is not necessarily exempt because its factory floor is small or the investor asserts limited emissions. Relevant facts include the footprint, production process, hazardous inputs, water consumption, wastewater, traffic, drainage modification, noise, and proximity to sensitive habitat. Where an activity is legally prohibited at the site, preparation of an impact study cannot convert an impermissible location into a permissible one.

An environmental assessment should not be confused with an ecological damage survey. The former asks whether anticipated impacts can be lawfully and acceptably managed before or during authorization. The latter investigates actual change in environmental condition, the causal pathway, and any restoration obligation after a suspected violation. At Tahura Ngurah Rai, publicly reported fill and permanent structures justify further evaluation. They do not supply a measured baseline of lost mangrove

area, contaminant concentrations, or hydrological change. Scientific claims about an individual project require a spatially defined baseline, sampling records, appropriate comparison sites, and a transparent method for attributing effects.

Mangrove wetlands illustrate why conventional factory assessments may miss interconnected risks. Their ecological functions depend on tidal exchange, freshwater inflow, sediment movement, root-zone oxygen conditions, and links with adjacent waterways. A concrete wall or compacted fill may change water movement even when a production process emits relatively little direct pollution. Roads and vehicle movement can fragment habitat. Conversely, proximity alone cannot establish the magnitude of ecological damage. Alongi [1] emphasizes the complexity of mangrove resilience; Friess and colleagues [3] describe the multiple human pressures shaping mangrove loss. Those findings justify precautionary examination, not site-specific figures invented from general literature.

The permit audit must request the application as submitted, coordinates, business-activity classification, the applicable environmental screening decision, any AMDAL or UKL-UPL documents, the resulting environmental approval, compliance obligations, inspection reports, and evidence of public participation where required. A publicly unavailable document is neither confirmed valid nor definitively absent. A regulator may lawfully ask the operator to produce it. If an instrument was issued on materially incorrect assumptions, the agency must examine correction, suspension, or revocation procedures under the governing legal framework. If required approval never existed, the available enforcement route depends on the precise violation and any applicable transitional provisions.

Public participation in environmental assessment should likewise be examined through actual procedural records. Where participation is required, the reviewer should identify who was informed, which project description was made available, whether the protected-area issue was disclosed, and how relevant objections were addressed. Publication of a project name without accurate coordinates would be a poor substitute for intelligible information about a site adjacent to mangroves. A complete file should distinguish objections about emissions from objections about location. The legal significance of a public objection depends on the applicable procedure, but the information it raises can reveal errors that officials may otherwise overlook.

The distinction between screening and management is worth emphasizing. Even a technically detailed mitigation plan cannot always offset a site designation that excludes industrial manufacturing. Conversely, an activity permitted by the relevant spatial plan still needs any environmental instrument triggered by its nature, scale, or proximity to protected habitat. Regulators should not solve a zoning defect by demanding a larger environmental study; neither should they solve an impact-assessment defect by pointing to a zoning certificate. The four-gate test is designed to prevent that substitution. Its starting point is the legal capacity of a proposed location to host the activity at issue.

E. A Four-Gate Legality Test for the Reported Factory

The relationship among conservation, tenure, planning, and licensing can be stated as a four-gate test. The first gate is the formal legal status of the land. Forest-boundary documents and the area's conservation designation supply the governing framework. The second gate is lawful tenure, examined through certificate files, cadastral maps, lease documents, and the parties' legal capacity. The third gate is spatial conformity under the applicable provincial and local plans. The fourth gate combines environmental approval with business, building, and relevant sectoral permissions. The gates are cumulative in the sense that success at one does not remove the duty to comply with the others. They are not identical sources of authority.

The order also determines how evidence should be gathered. A licensing office faced with contradictory maps should seek boundary verification before treating a business identification number as a definitive site clearance. A forestry agency that alleges encroachment should provide the designation instrument and coordinates, rather than relying on a general description of the neighborhood. A land office should disclose the lawful basis and cadastral history for the certificate under review through the appropriate procedure. An environmental regulator must evaluate both legal eligibility and potential impact. Coordination should leave an auditable record: who supplied each map, when it was revised, which coordinates were used, and which agency resolved the overlap.

The EcoCrete reporting reveals questions under each gate, but it does not answer all of them. Committee members characterized the site as conservation land; the underlying legally authoritative overlap map was not attached to the supplied manuscript. Four local landowners were reported to possess certificates and to have leased the land, yet the certificate types and issuance dossiers were not reproduced [17]. Provincial officials described incomplete permissions and temporary sealing, while the complete OSS and environmental-approval files were not available for independent inspection. These facts support an urgent, multi-agency legal audit. They do not support a scholarly declaration that every possible legal violation or criminal element has already been proved.

Table I: Evidentiary Checkpoints Under the Four-Gate Legality Test

Gate	Core question	Documents or verification	Public-record status
1. Conservation	Is the footprint inside a formally designated Tahura or other protected zone?	Designation decision, forest-boundary map, verified parcel overlay.	Committee alleged overlap; complete authoritative map not supplied [17].
2. Tenure	What land right exists, and can the lease lawfully cover the site?	Certificate type and issuance dossier, cadastral map, lease, party capacities.	Four local certificate holders and a 20-year lease were reported [17].
3. Spatial plan	Does manufacturing conform to the binding spatial plan for these coordinates?	Bali RTRW 2023-2043, applicable municipal plan, KKPR record.	Site-specific plan conformity not independently established.
4. Authorization	Do environmental, OSS and technical records cover the real activity at this site?	Screening, environmental approval, OSS history, site plan, inspection order.	Officials reported incomplete permits and temporary sealing [17].

Source: *the author's doctrinal synthesis; reported-case facts are attributed in the final column.*

A practical outcome of the test is a distinction between a defect that can be administratively corrected and an activity that cannot lawfully occupy the location. Clerical coordinates may sometimes be corrected through a formal procedure. An incomplete document may be supplied if the underlying activity is lawful and the legislation permits the relevant remedial process. A substantively incompatible factory site cannot be legalized simply by paying a fine, changing the label on a business activity, or commissioning a retrospective AMDAL. The available legal response must be matched to the kind of defect. This differentiation can prevent enforcement from becoming either arbitrary or ineffectively procedural.

An evidentiary matrix is particularly useful where public statements reach different audiences. News reports may use the word 'illegal' to describe an activity already sealed by authorities. A doctrinal article must specify the asserted rule, the required elements, the supporting documents, the decision-maker with jurisdiction, and the current procedural status. This discipline protects both environmental interests and fair administrative process. The benefit is practical: an enforcement decision grounded in a complete record is less vulnerable to reversal caused by a technical error or the misuse of an outdated provision.

The framework also clarifies what an adverse administrative finding should say. A properly reasoned order would identify the exact site, the instrument establishing its legal status, the observed activity, the approval or requirement that was missing or breached, and the measure proportionate to that breach. It should distinguish facts personally observed by inspectors from statements received from other agencies or third parties. Where the case depends on disputed mapping, the order should specify whether the restriction is interim pending verification or final following a completed determination. That precision helps the public understand the decision and gives affected parties a meaningful basis for any legally available challenge.

F. Ecological Risk, Causation, and the Precautionary Response

Indonesian mangrove research underscores the importance of subsurface carbon in waterlogged soils. Donato and colleagues [23] identified exceptionally high carbon stocks in tropical mangroves, while Murdiyarso and colleagues [24] examined the climate-mitigation potential of Indonesian mangrove forests. Neither study measures the EcoCrete parcel. They demonstrate why a restoration order should consider soil condition and hydrology rather than measuring success solely by the number of planted seedlings.

The environmental stakes are not limited to the buildings visible during an inspection. The coastal ecosystem operates through connections between vegetation, substrate, tidal channels, and human settlement. Mangroves can retain sediment, provide nursery habitat, contribute to carbon storage, and buffer certain coastal hazards [1]-[3]. Their effectiveness varies with forest width, density, topography, hydrology, and the intensity of the disturbance. An article should therefore avoid the simplistic claim that every mangrove stand offers the same flood protection or that a specific episode of flooding can be attributed to a single factory without investigation.

News coverage of the September 2025 inspection relayed concerns about land filling and development near the park and adjoining waterways [17], [20]. Filling may alter drainage pathways or tidal exchange. The scale of any effect at the EcoCrete site remains an empirical question. The allegation should be tested through topographic surveys, historic satellite images, water-flow

observations, vegetation inventories, and comparison of the area before and after construction. The relevant impact zone may be larger than the factory's registered parcel. A disturbed channel, for example, can influence areas downstream, yet the causal link must be documented rather than assumed.

The precautionary principle has a narrower and more credible role than replacing all evidentiary standards. When a proposed activity presents plausible serious or irreversible harm to protected ecosystems, authorities need not wait for every long-term impact to materialize before applying lawful prevention powers. Temporary suspension pending verification may be proportionate when there are concrete indicators of incompatible construction or a missing authorization. A permanent order, monetary liability, or criminal allegation requires the evidence and procedure appropriate to the specific sanction. Precaution supports timely inquiry and harm prevention. It does not authorize a public agency to bypass jurisdiction, notice, or reasoned decision-making.

Environmental baseline design deserves particular attention. A credible field assessment would delimit the site with verified geographic coordinates, classify mangrove cover by species or habitat type where feasible, locate natural and altered drainage paths, document fill depth, and record evidence of discharge from industrial activities. Historical aerial imagery could help identify when visible changes occurred. Biological indicators and water-quality tests would address a different set of questions from cadastral or land-use maps. None of these activities was conducted by the author for the present study. Their inclusion here defines the evidence required for a future technical investigation, not empirical findings.

Valuation should also avoid unsupported monetary precision. Barbier and colleagues [2] show that coastal ecosystems provide numerous services, several of which are difficult to monetize reliably. A remedy based solely on the commercial cost of planted seedlings may fail to address hydrological function, habitat continuity, and the time required for ecological recovery. Monetary valuation is useful when supported by a proper method and legally relevant evidence. In a legally protected mangrove system, restoration objectives should begin with the ecological function that has actually been affected. Financial calculations can complement that assessment, not replace it.

A further distinction concerns direct damage and induced development. A single industrial site may create access roads, utility corridors, demand for adjoining storage, and expectations that further businesses will be permitted. Those possibilities are planning risks. They should not be reported as observed cumulative impacts unless the wider pattern is documented. An integrated spatial audit can assess whether the reported site is isolated or part of a broader process of coastal conversion. Such an audit should be public enough to support community scrutiny while protecting sensitive environmental data and the procedural rights of affected landholders.

Environmental monitoring after an enforcement intervention should be scheduled around the ecology of the site, not only the administrative calendar. Seasonal precipitation and tidal conditions can change salinity, inundation patterns, sediment movement, and the visibility of affected vegetation. A single visit shortly after an inspection may fail to detect delayed impacts or may confuse seasonal variation with industrial effects. Where restoration is ordered, monitoring should use baseline indicators and defined performance criteria over a suitable period. These are methodological recommendations, not claims that any particular seasonal or chemical change has already occurred at Tahura Ngurah Rai.

G. Administrative Enforcement and the Responsibilities of Public Agencies

Administrative enforcement is the most immediate legal response when an authority finds a possible licensing or land-use violation. The measures available under environmental, forestry, spatial-planning, and business-licensing law differ in trigger, purpose, issuer, and procedure [7], [8], [12]-[15]. A temporary sealing reported by the press is best understood as an initial control measure pending further review unless the formal order states otherwise. It should be followed by an identifiable written decision, an inventory of observed activity, preservation of physical and digital evidence, an opportunity for the affected parties to respond, and a clear explanation of any requirements for resuming operations.

Effective enforcement requires the right institution to address the right defect. A spatial-planning body can document incompatibility with the operative plan. The forestry authority must speak to forest-area status and relevant forest-use rules. A land office can examine the cadastral and certificate history. Environmental authorities assess environmental obligations and actual damage. Investment licensing authorities check the company's OSS record against its authorized activities and location. Coordinated action reduces duplicated visits, inconsistent instructions, and opportunities for an operator to present one agency's paperwork as if it overruled another agency's legal findings.

Responsibility should not be assigned by headline. A government officer may have issued a certificate or processed an application without access to reliable interagency spatial data. Another officer may have overlooked a documented warning or failed to act after a legally sufficient complaint. The legal consequences are not the same. Law No. 30 of 2014 on Government Administration, read with later amendments, provides a framework for evaluating authority, procedure, administrative discretion,

and general principles of good governance [21]. Any allegation of official misconduct needs the relevant decision file, chronology, division of responsibility, applicable legal duty, and evidence of the official's conduct.

The September hearing illustrates the importance of preserving institutional chronology. ANTARA reported that Pansus TRAP gathered officials and questioned the overlap between certified parcels and the grand forest park, with temporary sealing already reported at the initial stage [17]. An oversight committee can reveal inconsistencies and request records. Its findings should trigger action by bodies legally empowered to amend, suspend, revoke, investigate, or adjudicate particular instruments. Legislative scrutiny does not substitute for a cadastral adjudication or court proceeding. Keeping the roles distinct can strengthen the legal durability of whatever enforcement action follows.

A useful administrative file would therefore have a single case register with separate documentary tabs: designation and boundary; titles and leases; spatial-plan conformity; environmental authorization; OSS and sectoral licensing; inspection findings; notice and response; interim orders; technical damage assessment; and final disposition. Every agency should record the documents it relied on and the unresolved questions outside its competence. A structured file permits review by a supervisory body, an administrative court where jurisdiction applies, and the public to the extent permitted by law. It also reduces the risk that the case disappears once the immediate media attention fades.

Compliance strategy should distinguish cessation, correction, and restoration. Cessation addresses continuing activity. Correction repairs a document, process, or legally remediable condition. Restoration addresses environmental damage attributable to the activity, based on an appropriate technical assessment. When a site is substantively incompatible with conservation status, cessation may need to be followed by removal of infrastructure and rehabilitation, subject to the competent authority's orders. If mapping proves the industrial parcel to be outside the legally designated area, officials must still assess adjacent-area environmental obligations and the site's actual zoning. Neither scenario can be resolved from one document alone.

A cross-agency protocol can also manage conflicting official interpretations. A licensing office may reasonably ask whether it should rely on an existing certificate while another agency contests the underlying title. The response should not be an informal telephone instruction that leaves no trace in the record. Instead, the competent bodies should issue coordinated written findings, preserve the contested evidence, and clearly identify any pending judicial or administrative process. The company should receive the operative instructions from the agency authorized to regulate its activity. This mechanism prevents administrative uncertainty from becoming de facto permission to continue a potentially incompatible use.

Table II: Distinct Legal Questions and Their Proof Requirements

Question	Primary decision-maker	Proof needed	Potential response
Forest status	Competent forestry authority	Designation, boundary and coordinate verification	Status determination; legally authorized forest enforcement.
Title validity	Land agency or competent court	Issuance dossier, title history, certified parcel overlay	Correction, adjudication or other procedure based on evidence.
Operational compliance	Spatial, environmental and licensing agencies	Applicable plan, approvals, actual site activities	Reasoned administrative measures, including suspension if justified.
Actual damage	Environmental authority and experts; court where needed	Baseline, field measurements, causation and extent	Evidence-based restoration and available civil or penal proceedings.

Source: *the author's doctrinal synthesis; reported-case facts are attributed in the final column.*

H. Civil, Criminal, and Restoration Pathways

Environmental civil liability requires a legally sound theory of responsibility, proof of relevant conduct, identifiable damage or legally recognized risk, and the causal relationship required by the applicable claim. The environmental statute provides instruments for compensation and ecological recovery [8]. Government agencies and eligible claimants may have distinct standing under different provisions. Public-interest litigation may help when environmental governance fails, yet statutory class actions, environmental-organization claims, governmental claims, and citizen lawsuits should not be treated as identical procedures. Each has separate standing, admissibility, and evidentiary questions.

Strict liability is sometimes described in broad terms that conceal its statutory limits. Article 88 of the Environmental Protection and Management Law, as amended, must be read according to its operative elements; it does not impose liability without proof in every case involving a building near trees [8], [10]. Whether a particular manufacturing activity falls within its scope requires evidence of the relevant statutory circumstances, including any qualifying hazardous substances, hazardous waste, or serious environmental threat. The absence of a requirement to prove fault under a qualifying strict-liability claim does not remove the need to demonstrate the other essential elements of the claim. A court must still decide matters within its jurisdiction.

Criminal enforcement is still more exacting. A charge based on pollution, environmental damage, unauthorized activity, unlawful forest occupation, or spatial-plan violations must be connected to the offense as defined by the statute in force at the relevant time. Investigators must determine the legal status of the location, conduct attributable to the accused, the required mental or negligence element where applicable, and any statutory threshold of harm. A finding of incomplete business documentation is not interchangeable with proof of every environmental crime. The distinction safeguards the presumption of innocence while allowing authorities to pursue appropriate charges when evidence supports them.

A responsible legal response also considers the potential rights of workers and third parties. Media coverage after the September 2025 inspection reported that the facility had suspended activity and that employees had been affected [22]. Workforce implications do not override a protected-area restriction. They do mean that an enforcement plan should give lawful instructions about hazardous-material storage, access for safety measures, preservation of wage and employment records, and the orderly securing of the site. Abrupt abandonment of chemicals or unfinished infrastructure could produce additional environmental risks. Authorities should manage the transition in a manner compatible with both conservation objectives and other legal duties.

Restoration presents the longest horizon. Demolishing a structure does not necessarily restore former tidal exchange or soil chemistry. Replanting without addressing hydrology may achieve little. The remedy should be based on the established nature and extent of disturbance, legal authority for the order, a technically coherent restoration plan, monitoring indicators, and independent verification over time. This sequence follows the ecological insights of mangrove research [1]-[3]. Where damage is not demonstrated, officials should avoid imposing a quantified restoration bill unsupported by assessment; where damage is demonstrated, the remedy should not be reduced to an administrative fee that leaves the ecosystem impaired.

The possible distribution of liability between operator and other actors also demands precision. A company directing construction may have different obligations from a shareholder uninvolved in day-to-day operations. A landowner's contractual assurances may matter in private litigation without automatically making the owner liable for every act of a tenant. A public officer's failure to perform a specific duty requires proof of that duty and of the relevant conduct. The principle that multiple actors may be accountable is defensible; a blanket assertion that every named person is already jointly guilty is not. Fact-sensitive attribution makes enforcement credible rather than weak.

Evidence preservation is indispensable if administrative inspection develops into litigation. Investigators may need authenticated records of the initial condition, accurate timestamps, a map of inspected structures, photographs with recorded locations, production inventories, waste-handling documents, and a clear chain of custody for samples. Different proceedings may use overlapping evidence while applying distinct legal standards. Collecting evidence carefully during the first intervention improves the reliability of later decisions. It also protects affected parties from an allegation built entirely on press photographs or unrecorded statements.

I. Institutional Design: Prevention Before Retrospective Sanctions

The case suggests a preventive reform centered on geospatial reconciliation. Protected forest boundaries, regional spatial-plan layers, cadastral parcels, and OSS application coordinates should be interoperable enough to identify likely conflicts at the earliest legally relevant stage. A flagged overlap ought to route the application to the competent forestry, planning, and land authorities rather than generating a misleading appearance of unconditional clearance. An automated warning is only the beginning. Formal legal status must still be decided by the agency that has statutory authority over the relevant record.

Giri and colleagues [25] used satellite imagery to map mangrove distribution at broad spatial scales. Their work supports the use of remotely sensed imagery in screening changes over time, provided classification uncertainty and resolution are disclosed. Satellite classifications cannot by themselves prove a parcel's legal title or the precise boundary set by an Indonesian forest-designation decision. They are a valuable complement to archival maps, not a substitute for them.

Data quality matters more than an attractive dashboard. Protected-area polygons may use different coordinate reference systems, have varying map scales, or reflect designation decisions issued at different times. A digitally detected overlap can be a true conflict, a boundary uncertainty, or an artifact of inconsistent data. The system should retain version histories, log human

overrides, attach the authoritative map instrument, and state the confidence or limitations of an automated match. Decisions affecting property or business operations should not be made by an opaque algorithm that affected persons cannot contest. The purpose of digital coordination is better evidence, not the transfer of legal responsibility to software.

Community participation supplies an additional form of early warning. Residents, researchers, civil-society organizations, and local fishers may notice filling, drainage obstruction, vegetation clearance, or new construction before a formal inspection occurs. Reporting channels should accept geotagged observations while preventing the public disclosure of unverified personal accusations. Agencies should acknowledge complaints, provide case numbers, set an intelligible timetable for initial review, and explain whether the issue concerns zoning, forest status, environmental compliance, or land registration. Proper feedback can encourage well-founded participation without transforming every online accusation into a public enforcement verdict.

An integrated inspection protocol would reduce the false distinction between an environmentally 'clean' factory and a legally unsuitable industrial location. Inspectors should record both industrial processes and site conditions. A low-emission product does not demonstrate compatibility with a conservation area. Similarly, a facility constructed beside rather than inside the formal park boundary may still require closer impact screening under Government Regulation No. 22 of 2021 [13]. The protocol should direct officials to record parcel coordinates, observe drainage and vegetation, identify production equipment, photograph potential discharge paths, and compare the enterprise's declared activity with what is physically present.

The provincial spatial plan already supplies an institutional anchor for preventive oversight. Regulation No. 2 of 2023 guides land-use allocation and conservation-related spatial policy for 2023-2043 [16]. A shared dashboard could associate the operative plan with the underlying forest and cadastral documents, allowing an inspector to identify the legal source behind a zoning symbol. Public-facing summaries could show whether an industrial activity is pending review, temporarily suspended, authorized with conditions, or subject to a final order. These statuses should be updated from formal records. A news article should not be allowed to function as the government's permanent case register.

Oversight also requires follow-through after a hearing. A legislature may uncover a disputed development, but prevention depends on the executive agencies responsible for translating evidence into lawful, reviewable decisions. The case file should document the dates of inspection, requests for records, responses, boundary verification, decisions, remedies, and subsequent monitoring. If records remain incomplete, the status should say so rather than silently treating the matter as closed. A publicly intelligible chronology makes it possible to evaluate whether the temporary intervention reported in September 2025 led to a completed legal review and any warranted ecological recovery.

The resulting governance model is not anti-investment. It distinguishes lawful industrial development from an incompatible location. A predictable rule that screens conservation conflicts before capital is committed protects investors against avoidable sunk costs while preserving the legal function of protected areas. It also helps local governments avoid disputes that emerge only after machinery has arrived and workers have been hired. The key administrative obligation is to communicate early, reconcile records accurately, and state the reasons for every material decision. The rule of law has equal importance for environmental interests and for enterprises entitled to clear procedures.

Prevention should be measurable. A provincial protocol could report the number of applications flagged by a protected-area overlay, the number confirmed as genuine conflicts, the time required for competent agencies to resolve ambiguous boundaries, and the number of correction or refusal decisions that remain effective after review. These figures would measure administrative performance rather than pretend to quantify environmental protection from the mere existence of a digital dashboard. Over time, properly documented reviews could reveal whether land-data errors, incorrect project descriptions, or failures of interagency referral are the main causes of conflict.

J. Procedural Fairness, Transparency, and Public Confidence

Legal certainty depends on transparent administration even when environmental risks justify an immediate response. If a permit is suspended, the relevant notice should identify the action required, the legal basis for intervention, the facts that remain disputed, and the route for submitting contrary evidence. Public communication should distinguish an investigation from a proven offense. Officials can explain why a sensitive site is under review without publicly declaring each shareholder or titleholder guilty. The quality of procedure matters particularly when an interim restriction may affect employees, contractual commitments, and surrounding businesses.

The public has a legitimate interest in knowing whether a protected ecosystem is being safeguarded. Agencies should publish non-sensitive information about the stage of the case, the applicable forest and spatial-plan documents, the type of administrative decision issued, and whether any restoration program has been approved. Disclosure must also respect protected personal information and the integrity of ongoing proceedings. A searchable register of final decisions, with concise summaries and links to

primary documents where lawful, would be more reliable than a sequence of informal statements to the media. Public confidence increases when the legal reasons for action are accessible and internally consistent.

Fair procedure offers a practical advantage for conservation. A flawed notice, an unexplained jurisdictional claim, or the use of an obsolete map can delay remediation by inviting a credible procedural challenge. Agencies should therefore invest in document quality before making broad public assertions about the case. The operator should be required to supply necessary records and comply with valid interim restrictions. At the same time, public bodies should respond to relevant evidence, record any amendments to their position, and provide explanations for material decisions. This combination avoids presenting environmental protection and procedural rights as mutually exclusive objectives.

K. Limits of the Findings and Implications for Further Research

This study's findings are doctrinal and documentary. They identify the governing legal questions, the order in which evidence should be assessed, and the consequences that may follow under specified factual scenarios. They do not independently verify the site boundary, determine the validity of any certificate, audit the company's complete OSS account, or measure environmental damage. The September 2025 reporting establishes that the matter was publicly investigated and that a temporary enforcement response was described [17]-[20]. Any later administrative or judicial outcome should be assessed against the primary decision and its date rather than inferred from early press coverage.

Future research should obtain the formal forest-designation map, certified cadastral data, municipal detailed spatial plan, lease documentation, relevant company and OSS records, environmental screening decision, and signed enforcement orders. A geospatial overlay conducted with documented methodology could then settle the central boundary issue. Interviews with officials and affected parties, if ethically approved, could explain how conflicting data entered the licensing process. Environmental sampling and remote-sensing analysis would be needed for a claim about the actual magnitude of ecological damage. These projects would extend, not retrospectively transform, the limited documentary study presented here.

The analytical framework can travel beyond Bali. Indonesia contains numerous sites where urban development approaches forests, wetlands, river corridors, and protected coastlines. The central problem is not confined to foreign-capital factories. Any proposed commercial use may encounter inconsistent cadastral records, outdated spatial layers, or sectoral licenses issued without a resolved site classification. A four-gate audit offers a repeatable way to identify which institution must decide the next issue. Its value depends on resisting two shortcuts: treating an electronic license as conclusive proof of all other permissions, or declaring guilt before the competent body has established the contested facts.

IV. CONCLUSIONS

The reported EcoCrete facility at Tahura Ngurah Rai illustrates the legal vulnerability created when forest designation, private title, spatial conformity, environmental approval, and business licensing are examined separately. Contemporary Indonesian law offers distinct instruments for each issue. The applicable framework includes the conservation legislation as amended in 2024, the updated Bali spatial plan of 2023, the Job Creation legislation of 2023, and the risk-based licensing regulation that entered into force in June 2025. Applying superseded rules can produce a misleading conclusion even when the underlying conservation concern is legitimate.

The available public record supports a documented dispute and a temporary enforcement response following the September 2025 inspection. It does not establish a final judicial finding, the definitive validity or invalidity of the reported land certificates, or a scientifically quantified ecological loss. Legal judgment should therefore proceed conditionally. A factory shown to occupy a site where such activity is prohibited cannot rely on a lease or OSS record to cure the location defect. When the boundary itself is disputed, the proper first step is an authoritative, transparent reconciliation of forest maps and cadastral evidence.

A practical response has three parts. The competent agencies should complete a coordinated documentary and on-site audit under the four-gate test; any interim restrictions should be recorded in a reasoned, reviewable order. Confirmed violations should receive remedies proportionate to the applicable statute and supporting evidence, with ecological restoration where actual damage has been established. Future applications near conservation boundaries should trigger interoperable geospatial screening, mandatory referral of unresolved overlaps, and an auditable decision trail. These steps can provide predictability for lawful investment without weakening the legal protection of Bali's mangrove landscape.

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