

Development and PQF Level Alignment of a Professional Specialization in Nature-based Solutions and Resilient Urban Design

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ABSTRACT

This study develops and analytically evaluates a proposed Level Alignment Matrix (LAM) for a post-licensure specialization in Nature-based Solutions and Resilient Urban Design (NbS–RUD) within Philippine environmental planning. Using a design-science approach that combines documentary synthesis, doctrinal legal analysis, competency modelling, constructive alignment, evidence-centered assessment design, and evaluability-to-decision analysis, the study derives a qualification artifact grounded in Republic Act No. 10587 (Environmental Planning Act), the Philippine Qualifications Framework Act as broadened by Republic Act No. 12313, PQF-NCC Resolution No. 2026-02, PRC CPSP–CATS issuances, and the Philippine Ecosystem and Natural Capital Accounting System Act. The artifact comprises eight Professional Practice Outcomes, 32 Intended Learning Outcomes, six non-compensable award gates, a programmatic assessment architecture, and a three-state Level Alignment Matrix. Independent three-state coding of all 256 Intended Learning Outcome-to-descriptor relationships identified 66 complete, 59 partial, and 131 no-alignment judgments; every PQF Level 7 descriptor component retains at least one completely aligned outcome. Requirements-traceability testing, adjacent-level counterfactual analysis, negative-case and adversarial testing, comparator differentiation, and scenario demonstrations converge on PQF Level 7 as the most coherent classification for the complete role, while a reduced role fits Level 6 and a universal frontier-knowledge requirement would demand Level 8. All research questions and pre-specified analytical tests are closed within the study's documentary design-science scope. The qualification remains a proposed artifact requiring independent occupational, stakeholder, assessment, workload, institutional, and regulatory validation before recognition or award.

Keywords: *Nature-based solutions; Resilient urban design; Environmental planning; Philippine Qualifications Framework; Professional specialization*

INTRODUCTION

Nature-based Solutions (NbS) have become an important but contested field of climate, biodiversity, disaster-risk, and urban policy. The United Nations Environment Assembly (UNEA, 2022) defines NbS as actions to protect, conserve, restore, sustainably use, and manage natural or modified ecosystems that address societal challenges effectively and adaptively while providing human well-being, ecosystem-service, resilience, and biodiversity benefits. The definition sets a demanding construct: a green label alone is insufficient. A credible intervention must

connect an identified societal challenge to ecological processes, measurable benefits, appropriate scale, biodiversity integrity, inclusive governance, trade-off management, long-term viability, and adaptive learning (IUCN, 2026a; Seddon et al., 2021).

Urban application magnifies the difficulty. Cities concentrate hazards, exposure, vulnerable populations, infrastructure dependencies, contested land, unequal environmental benefits, and fragmented authority, so urban resilience concerns the capacity of interdependent social, ecological, and technological systems to persist, adapt, and transform without reproducing unacceptable risk or injustice (McPhearson et al., 2022; Meerow et al., 2016).

Resilient Urban Design (RUD) supplies the spatial and performance bridge between climate and disaster-risk assessment and implementable urban form, requiring planners to be competent in urban structure, connected green–blue systems, density and mix, public realm, mobility, hybrid infrastructure, adaptation pathways, and institutional mainstreaming, while respecting the disciplined interfaces that separate planning-level frameworks from detailed architectural, landscape-architectural, civil, hydraulic, and geodetic design.

Republic Act No. 10587 (2013), the Environmental Planning Act, defines environmental planning and its lawful scope for physical and comprehensive land-use planning, zoning, area and site development, environmental and institutional studies, capacity building, and implementation monitoring. The phrase “planning-level RUD” used throughout this study is an analytical construct developed for the purpose of this research; it is not statutory terminology and does not enlarge the profession’s lawful scope beyond Sections 31, 35, and 39 and the laws governing allied professions.

The qualification question is governed by an equally demanding legal and policy architecture. Republic Act No. 10968 (2018) establishes the outcomes-based, quality-assured Philippine Qualifications Framework (PQF); Republic Act No. 12313 (2025) institutionalizes the Lifelong Learning Development Framework and broadens the mandate of the PQF National Coordinating Council (PQF-NCC); Republic Act No. 10912 (2016) links continuing professional development to career progression and specialization; and PRC Resolutions Nos. 1117 (2018), 1262 (2020, as amended), and 2060 (2025) establish the Career Progression and Specialization Program–Credit Accumulation and Transfer System (CPSP–CATS) architecture. PQF-NCC Resolution No. 2026-02 revises the PQF domains to Responsibility and Autonomy, Knowledge and Understanding, and Skills and Application. A defensible Level Alignment Matrix (LAM) must therefore evidence a coherent professional role, outcomes, level, assessment, workload, quality assurance, learning pathway, and legal authority; it cannot be a table of thematic similarities.

A reproducible OpenAlex title-and-abstract search (retrieved 19 August 2026; 1 January 2010–16 August 2026) returned 935 records for “nature-based solutions” combined with “urban planning,” 215 with “urban design,” and 121 with “assessment framework,” but only 54 for NbS combined with competency or competence, no record for

“professional qualification,” four for the Philippine urban-planning context, no record for “resilient urban design” with competency or competence, and no record for “level alignment matrix” with qualification within the stated field, date, and language boundary. These database-sensitive results establish a concentration pattern rather than a universal absence, but no integrated Philippine post-licensure artifact was located that simultaneously defines the NbS–RUD specialist role, respects Republic Act No. 10587 and allied-professional boundaries, uses the 2026 revised PQF Levels 6–8 descriptors, aligns Professional Practice Outcomes (PPOs) and Intended Learning Outcomes (ILOs) with all three PQF domains, specifies authentic evidence and non-compensable gates, and distinguishes design-stage findings from regulatory recognition.

The research problem is therefore both substantive and methodological: what specialization should be constructed, and how can its level claim be derived and tested without circular reasoning, universal marking, or credential overstatement? The study’s general objective was to develop and analytically evaluate a research-grounded LAM for a proposed post-licensure specialization in Nature-based Solutions and Resilient Urban Design within Philippine environmental planning, by establishing a transparent and sufficiently broad documentary knowledge base; deriving a lawful professional role, PPOs, ILOs, assessment evidence, and safeguards from that evidence; separating outcome derivation from PQF-level assignment and applying a post hoc Levels 6–8 comparison; constructing a complete LAM with explicit ILO alignment to the three revised PQF domains; evaluating requirements coverage, descriptor fidelity, mapping discrimination, negative cases, comparator differentiation, professional boundaries, and representative scenarios; and defining the evidence and authorization required before formal recognition, credit assignment, and award.

For the environmental planning profession, the study converts an emerging field into a testable specialist role rather than a catalogue of techniques, giving regulators, the accredited professional organization, educators, assessors, employers, and communities a common outcome and evidence language, and demonstrating how the 2026 PQF descriptors can be applied as integrated role expectations rather than isolated verbs. The study is bounded to documentary and analytical verification of a design artifact; it does not include human-participant occupational analysis, stakeholder consultation, assessment piloting, or

regulator approval, and the proposed title, level, credit, and registry status therefore remain subject to formal validation and competent-authority action.

Several terms carry a specific operational meaning throughout this study. Nature-based Solutions denotes actions satisfying the UNEA definition and evaluated through current IUCN criteria, including societal challenge, scale, biodiversity integrity, economic feasibility, inclusive governance, trade-offs, adaptive management, and mainstreaming. Planning-level resilient urban design denotes the environmental-planning application of spatial frameworks, urban-form principles, performance criteria, policies, programs, and professional interfaces under Republic Act No. 10587, and not a claim to reserved allied-professional detailed design. A professional specialization is a formally defined body of advanced post-licensure professional competence expressed through a role, outcomes, evidence, quality assurance, and a recognized qualification level. Three-state alignment means that each ILO-component relationship is classified independently as complete, partial, or no alignment, and a non-compensable gate is a mandatory standard whose failure cannot be offset by stronger performance elsewhere because legality, ecological integrity, rights, evidence authenticity, residual-risk safety, or individual competence would be compromised. Finally, analytical verification denotes document-based testing of internal coherence, traceability, legal fit, descriptor fit, counterfactual behavior, and negative cases, and is expressly distinguished throughout from external or empirical validation.

LITERATURE REVIEW

The NbS field overlaps with ecosystem-based adaptation, ecological restoration, green infrastructure, blue-green infrastructure, and ecosystem-based disaster-risk reduction, and the IUCN Global Standard for Nature-based Solutions, Second Edition, translates the UNEA construct into eight criteria and 27 indicators covering societal challenges, scale, biodiversity and ecosystem integrity, economic feasibility, inclusive governance, trade-offs, adaptive management, and mainstreaming (IUCN, 2026a). The standard functions as a non-compensatory quality framework rather than a label: a credible intervention hierarchy first protects functioning ecosystems, then restores or sustainably manages degraded systems, and uses created or heavily modified features only when contextually justified, because poorly framed NbS claims can

obscure biodiversity loss, delay emissions reduction, or promote ecologically weak interventions (Seddon et al., 2021).

Evidence supports the capacity of NbS to reduce climate risks, but performance is neither universal nor context-free. Chausson et al. (2020) found substantial but unevenly distributed evidence for adaptation benefits across intervention types, and the World Bank's (2021) catalogue of urban NbS families is most useful when applied through process–function–benefit reasoning and suitability analysis rather than as a menu. Hybrid green-blue-grey systems are often necessary, and a specialist must specify how natural and engineered components interact, including sequence, capacity, redundancy, exceedance, failure modes, maintenance, and residual risk. Albert et al. (2021) frame NbS planning as a structured process of co-defining the setting, understanding challenges, creating visions and scenarios, assessing impacts, developing strategies, and realizing and monitoring solutions, guided by place specificity, evidence, integration, equity, and transdisciplinarity. Bush and Doyon (2019) identify temporal, spatial, functional, and social-equity trade-offs that urban planning must address, while Frantzeskaki et al. (2019) and McPhearson et al. (2025) show that evidence-based and mainstreamed urban NbS require stronger exchange among science, policy, design, management, and participation.

Urban resilience is the capacity of an urban system and its constituent social, ecological, and technological networks to maintain or rapidly return to desired functions, adapt to change, and transform systems that constrain future adaptive capacity (Meerow et al., 2016), which means RUD cannot be satisfied by adding green features to an otherwise risk-producing pattern of development. The Philippine UN-Habitat/DHSUD (2023) reference tool links climate information and Climate and Disaster Risk Assessment to design decisions from territorial to site-interface scales; Ahern's (2011) safe-to-fail principle and Haasnoot et al.'s (2013) dynamic adaptive policy pathways support diversified systems whose localized failures do not cause catastrophic collapse. Planning-level RUD differs from detailed professional design: environmental planners may formulate spatial frameworks, performance standards, and urban design guidance within Republic Act No. 10587, while detailed landscape, architectural, civil, hydraulic, geotechnical, and structural documents remain subject to the laws governing those professions.

Biodiversity and ecosystem integrity sit inside, not beside, the NbS construct. CBD Target 12 calls for increased area, quality, connectivity, and biodiversity-inclusive urban planning (CBD, 2022), and DENR Administrative Order No. 2025-23 adopts the Philippine Biodiversity Strategy and Action Plan 2024–2040 as the controlling national roadmap. NbS also redistributes land, access, costs, risks, and development opportunity, so governance must address distributional, procedural, and recognition justice (IPCC, 2022; van der Jagt et al., 2023); for Philippine practice, the Indigenous Peoples' Rights Act, the Magna Carta of Women, the Urban Development and Housing Act, and local-government participation requirements create legally and ethically relevant safeguards. Economic appraisal must look beyond capital cost to avoided loss, ecosystem services, opportunity costs, maintenance, and the consequences of failure, and Republic Act No. 11995 (2024) institutionalizes ecosystem and natural-capital accounting for Philippine planning, programming, and continuing professional education. Monitoring, evaluation, and adaptive management require a credible theory of change and an evaluability precondition (Wholey, 1987) that keeps observation, evaluative inference, and authorized decision distinct, using contribution analysis where experimental attribution is impracticable (Mayne, 2008) and adaptive-pathway logic to trigger continuation, modification, or termination decisions (Haasnoot et al., 2013).

Within Philippine law, Republic Act No. 10587 (2013) establishes environmental planning as a regulated profession: Sections 4 and 5 define its scope, Section 14 requires registration, Section 31 prohibits unauthorized practice, Section 35 establishes civil liability for grossly negligent planning causing serious harm, and Section 39 preserves the recognized functions of allied professions such as landscape architecture (RA 9053), architecture (RA 9266), civil engineering (RA 544), and geodetic engineering (RA 8560). The specialization must therefore be framed as advanced environmental planning, not as a device for expanding statutory exclusivity, and the proposed Level 7 holder must direct strategy in complex or unpredictable contexts, synthesize multidisciplinary evidence, and design and evaluate new or materially improved planning systems—demands that distinguish specialization from ordinary continuing professional development.

The PQF is the quality-assured national system for developing, recognizing, and awarding outcomes-

based qualifications (RA 10968, 2018), broadened by RA 12313 (2025) to institutionalize lifelong learning and a cross-modal credit transfer system, and operationalized for licensed professionals through the CPSP–CATS architecture (PRC Resolutions Nos. 1117, 1262 as amended, 1591, and 2060). PQF–NCC Resolution No. 2026-02 supplies the revised domains and Levels 6–8 descriptors used in this study, and PRC Resolution No. 2060 (2025) fixes one CPSP–CATS credit at 40 notional learning hours while explicitly stating that credit does not measure level or quality. Competency-based education emphasizes demonstrated performance over seat time (Gervais, 2016; Gruppen et al., 2016), and constructive alignment requires learning activities and assessment to be deliberately aligned with intended outcomes (Biggs, 1996); for a professional qualification, outcomes must first be derived from a valid role and public need rather than reverse-engineered from a desired level.

Assessment and qualification-design theory supplies the remaining foundation. Cedefop's (2017) handbook on defining, writing, and applying learning outcomes underlines that an outcome must state an observable professional action, the object or context of performance, and the expected level of judgment or autonomy rather than a topic to be covered, while the AERA/APA/NCME Standards for Educational and Psychological Testing require that validity evidence support the specific interpretation and use made of an assessment result rather than the mere existence of a score (American Educational Research Association et al., 2014). Mislevy et al.'s (2003) evidence-centered design connects a competence claim to observable evidence and to tasks capable of eliciting that evidence, and Kane's (2013) argument-based validity approach requires the chain from observed performance to scoring, generalization, extrapolation, and award decision to be explicit and defensible. Applied to a professional qualification, these sources jointly imply that a high-level verb such as "evaluate," "lead," or "design" does not by itself establish an advanced level unless the task involves matching complexity, autonomy, multidisciplinary synthesis, consequence, and defensible criteria.

The literature converges on six controlling propositions: credible NbS requires ecological integrity, evidence, trade-off analysis, inclusive governance, and adaptation; urban effectiveness requires multi-scale integration; RUD converts risk into spatial and performance decisions while respecting detailed-design boundaries; rights and stewardship determine legitimacy; specialization

must remain anchored in Republic Act No. 10587 and allied-professional laws; and PQF/CPSP–CATS validity depends on demonstrated outcomes, appropriate assessment, workload evidence, and quality assurance. Comparator review of the IUCN professional certificate, the UNEP NbS massive open online course, and World Bank Academy offerings identified credible international capacity-building precedents, but none discloses the Philippine statutory-scope, three-domain PQF, CPSP–CATS, or environmental-planner boundary architecture required here (IUCN, 2026b; UNEP, n.d.; World Bank, n.d.-a, n.d.-b). The unresolved gap that remained was an integrated qualification architecture translating these propositions into a Philippine specialist role, assessable outcomes, Level 7 evidence, non-compensable gates, and a disciplined, discriminating alignment matrix.

MATERIALS AND METHODS

Research paradigm and design

The study used a pragmatic critical-realist orientation: the proposed qualification is an intentionally designed institutional artifact, but the phenomena it must address—hazard, ecosystem condition, professional authority, organizational capacity, rights, and learner performance—place real constraints on acceptable design. Documentary interpretation was used to formulate propositions, while design-science evaluation tested whether the artifact coherently responds to those constraints (Hevner et al., 2004; Peffers et al., 2007). Five mutually informing methods were integrated: structured scholarly scoping to characterize the literature and locate the qualification-design gap; documentary analysis of standards, policy, and guidance; doctrinal legal analysis to establish controlling authority, scope, and boundaries; competency modelling and evidence-centered design (Mislevy et al., 2003) to translate the professional role into outcomes and observable proof; and design-science evaluation of the artifact's traceability, level behavior, negative cases, comparator differentiation, and scenario performance.

Conceptual and analytical framework

Urban resilience problems were treated as interactions among social, ecological, and technological systems (McPhearson et al., 2022), which justified an emphasis on portfolios and treatment trains rather than isolated projects. Constructive alignment (Biggs, 1996) and evidence-centered design (Mislevy et al., 2003) required each

Intended Learning Outcome to connect a competence claim, observable evidence, and an eliciting task; outcomes were retained only when assessable through authentic professional products, performances, or reasoned decisions, following Kane's (2013) argument-based validity logic. An evaluability-to-decision framework, developed for this study from Wholey (1987), Mayne (2008), Kane (2013), and Haasnoot et al. (2013), traces six linked elements—causal architecture, baseline and comparison logic, monitored observation, evaluative inference, authorized decision, and feedback—so that no evaluative claim exceeds the strength of its supporting evidence. Legal analysis distinguished controlling statutes from implementing rules, PRC/Board resolutions, technical standards, and non-authoritative professional material, and applied four boundary rules: no outcome may authorize an act environmental planners are not legally permitted to perform; the qualification may require planners to commission, interpret, and integrate allied-professional evidence without claiming authorship of reserved work; multidisciplinary coordination may support Level 7 but does not erase professional boundaries; and title, credit, and registry status remain proposed until formally established.

PQF Level 7 descriptor decomposition

The integrated PQF Level 7 descriptors approved through PQF-NCC Resolution No. 2026-02 were independently decomposed into eight analytic descriptor components without amending the complete descriptors: two components under Responsibility and Autonomy (A1, strategic direction and leadership in complex or unpredictable contexts; A2, authoritative influence driving change and innovation), two under Knowledge and Understanding (K1, synthesis of theories and frameworks; K2, advanced multidisciplinary problem solving), and four under Skills and Application (S1–S2, development and application of specialized analytical and problem-solving skills; S3–S4, design and evaluation of new processes, systems, research, or original works). Coding was based on the complete performance, object, context, responsibility, autonomy, and assessable result rather than isolated verbs, and every ILO-to-component relationship was classified as complete when every material element was expressly stated or necessarily entailed, partial when at least one but not all material elements were entailed, or no alignment when no material element was entailed.

Units of analysis and source appraisal

The primary unit of analysis was the qualification claim: the assertion that a person who satisfies the proposed award requirements can perform an integrated NbS–RUD specialist role at a specified PQF level. Nested units were the legal professional role, design requirements, PPOs, ILOs, evidence claims, assessment tasks, non-compensable gates, individual descriptor marks, the three PQF domains, and the program-level classification, so that no single verb, course topic, or isolated cell could determine the level on its own. Each documentary source was used only for the proposition it could legitimately support under a claim–source fit rule: a statute could define scope or authority but not prove ecological effectiveness; a scientific review could support mechanisms or evidence limits but not confer professional jurisdiction; and a comparator program description could inform differentiation but not demonstrate PQF recognition. Controlling Philippine law, official standards and policy, peer-reviewed scholarship, official comparator descriptions, and unpublished professional material were each assigned a distinct permitted use and appraisal question, and inferences were labelled by language such as “supports,” “indicates,” or “is proposed” rather than presented as settled fact.

Evidence streams and search protocol

Four evidence streams were maintained: a legal-regulatory stream using official issuing-agency pages and repositories for Republic Acts Nos. 10587, 10912, 10968, 11995, and 12313 and their implementing issuances; a standards-policy stream (UNEA, IUCN, IPCC, CBD, DENR, DHSUD/UN-Habitat, UNDRR, World Bank); a scholarly stream using a structured, reproducible OpenAlex Works API search (title_and_abstract.search field, English-language filter, 1 January 2010–16 August 2026, retrieved 19 August 2026) followed by purposive selection of directly relevant peer-reviewed sources; and a comparator stream drawing on official IUCN, UNEP, and World Bank Academy program pages. Sources were appraised for authority, currency, triangulation, decision relevance, status/contradiction, and residual external-validation need; a domain was treated as “ready for design” only when all six conditions were documented, a determination that supports responsible design but does not itself establish occupational or empirical validity. Where sources conflicted, legal hierarchy, later valid issuance, subject-matter competence, and specificity controlled.

Artifact development and circularity control

Development proceeded through a controlled seven-stage chain: derive design requirements from public-value, construct, legal, and practice evidence without reference to PQF labels; freeze the professional role, Professional Practice Outcomes, Intended Learning Outcomes, evidence, and gate wording before any level coding; decompose the exact 2026 Levels 6–8 descriptors into the eight analytic components described above; apply the three-state necessary-entailment rule to classify every ILO-to-component relationship; recompose the program-level judgment against the complete three-domain descriptors rather than treating individual cells as independent standards; test adjacent-level counterfactuals by removing leadership/system-design attributes (Level 6 behavior) and by requiring universal frontier-knowledge creation (Level 8 behavior); and log residual interpretive choices and outstanding external-evidence needs. This sequence prevents a desired level from defining the role and makes a no-alignment judgment as informative as a complete one.

Analytical evaluation protocol

The completed artifact was subjected to eight analytical tests: requirements traceability (whether every design requirement is represented in outcomes, evidence, and gates, with no orphan requirement); descriptor coverage and mapping discrimination (whether all 256 ILO-to-component cells are classified without treating counts as targets); adjacent-level counterfactual testing; negative/adversarial case testing (whether gates reject attractive but invalid award evidence); comparator differentiation; scenario demonstration across contrasting Philippine planning contexts; a validation argument distinguishing analytically supported inferences from those requiring external validation; and an evaluability-to-decision audit of Professional Practice Outcome 7 and the integrated qualification evidence. Following Venable et al.’s (2016) evaluation-strategy framework, this evaluation is predominantly artificial and criteria-based; naturalistic evaluation in occupational and institutional settings is treated as a distinct, subsequent stage of validation rather than as an unanswered research question, and the manuscript therefore reserves “analytical verification” for the completed document-based evaluation and “external validation” for the empirical and institutional decisions that must follow.

Trustworthiness and ethical considerations

Credibility was pursued through source hierarchy, cross-domain triangulation, exact legal citations, explicit inference limits, and negative-case testing;

dependability through stable outcome identifiers and frozen wording prior to coding; and confirmability by separating source-derived propositions from design judgments and reporting complete, partial, and no-alignment results rather than optimizing a single score. No human participants, personal data, or confidential materials were collected. The research was deemed complete when the documentary knowledge base was judged sufficient under the stated appraisal rule, controlling authorities were current to the closure date, the professional role and outcomes were derived before level coding, all 256 ILO-to-component relationships were classified, the complete analytical test suite was executed, and every research question received a source-grounded answer paired with an explicit evidentiary boundary; research completion and qualification recognition were treated throughout as separate determinations.

RESULTS AND DISCUSSION

Documentary readiness and design requirements

The evidence synthesis produced 12 design requirements, specified before outcome coding, requiring the qualification to be challenge-led, ecologically credible, multi-scale, risk-informed, rights-respecting, lawful, implementable, assessable, level-discriminating, credit-disciplined, quality-assured, and transparent about recognition status. All 12 corresponding evidence domains—spanning PQF/CPSP–CATS, environmental-planning scope, NbS construct and credibility, urban planning and RUD, climate and disaster risk, biodiversity and ecosystems, rights and governance, economics and lifecycle stewardship, monitoring and adaptive management, competency and learning-outcome design, assessment validity and quality assurance, and credential and institutional governance—met the documentary readiness criteria of authority, currency, triangulation, decision relevance, status clarity, and a named residual-validation pathway. This finding means each domain has a competent source base sufficient to proceed responsibly to design; it does not aggregate evidence into a validity score, and the most consequential remaining gaps are occupational representativeness, interprofessional agreement, community and rightsholder acceptability, assessment performance, learner workload, provider feasibility, and formal regulatory authorization.

Professional role and outcome architecture

The proposed holder leads the diagnosis, planning, appraisal, institutional mainstreaming, implementation governance, monitoring, and adaptive improvement of NbS–RUD portfolios for

complex or unpredictable Philippine urban and regional contexts, integrating social, ecological, and technological evidence, exercising authoritative influence among institutions, and directing multidisciplinary interfaces while remaining accountable within lawful scope. The qualification does not make the holder an architect, landscape architect, engineer, ecologist, or finance specialist; it requires the planner to recognize when such expertise is necessary, procure or coordinate competent work, integrate the evidence, and preserve attribution and sign/seal rules. The artifact contains eight Professional Practice Outcomes organized around the professional work cycle—systems diagnosis and strategic framing; NbS credibility and ecological integrity; resilient urban design and spatial integration; planning, law, and institutional mainstreaming; inclusive governance, rights, and safeguards; economics, finance, implementation, and lifecycle stewardship; evidence, monitoring, evaluation, and adaptive management; and ethical leadership, professional stewardship, and innovation—decomposed into 32 Intended Learning Outcomes, each specifying a controlling performance, context and complexity, expected product or decision, and evidence limitations.

Assessment is programmatic rather than dependent on a single capstone: evidence must accumulate across authentic tasks and decision points and culminate in an integrated portfolio and individual oral defense, using claim–evidence–task reasoning in which the outcome states the competence claim, performance criteria define observable qualities, tasks create eliciting conditions, and evidence rules specify sufficiency, authenticity, currency, and provenance. Recognition of Prior Learning and Recognition of Prior Experiential Learning may provide access or credit only when prior learning is matched outcome-by-outcome to the same evidence standards, level, and gates; experience, seniority, or a foundation certificate is not itself learning evidence. For the evidence-monitoring outcome (PPO7), candidates must organize evidence as an evaluability-to-decision record—identifying what was observed, how it supports or weakens each inference, which rival explanations remain credible, what threshold applies, which actor is authorized to decide, and how the decision will alter subsequent evidence collection—rather than presenting a monitoring dashboard or an unsupported recommendation.

Non-compensable award gates and professional boundaries

Because aggregate scoring cannot ethically compensate for certain failures, six non-compensable gates were built into the award standard: lawful scope and professional interfaces; evidence authenticity and individual competence; NbS credibility and ecological integrity; rights, equity, and safeguards; safety and residual risk; and integrated Level 7 performance, which requires the candidate to individually demonstrate the complete role—including the documented contextual gap, creation and pilot of a process not previously available in that setting, comparative evaluation, and justified disposition required by ILO 8.3—so that aggregate module completion alone is insufficient. Republic Act No. 10587 authorizes the planner to lead the integrated planning process and establish spatial and performance requirements, but detailed architectural, landscape-architectural, engineering, geodetic, and ecological work remains subject to the responsible allied professional; each task in the artifact therefore specifies responsibility allocation, referral triggers, and required signature or seal.

Descriptor coverage and mapping discrimination

Independent three-state coding of all 256 ILO-to-descriptor-component relationships identified 66 complete, 59 partial, and 131 no-alignment judgments, with every Level 7 descriptor component supported by at least one completely aligned ILO: A1 (strategic direction) by 3 complete and 5 partial sources; A2 (authoritative influence) by 3 complete and 6 partial; K1 (synthesis of theories and frameworks) by 4 complete and 5 partial; K2 (advanced multidisciplinary problem solving) by 30 complete and 2 partial; S1 (development of specialized skills) by 3 complete and 15 partial; S2 (application of specialized skills) by 21 complete and 11 partial; S3 (design of new processes or systems) by 1 complete and 9 partial; and S4 (evaluation of new processes or systems) by 1 complete and 6 partial. ILO 8.3 alone completely aligns with S3 and S4 because successful performance necessarily creates a context-specific process not previously available, pilots it against baseline and alternative arrangements, and reaches an evidence-based disposition; ILOs that permit either a new or a materially improved process remain partial because that alternative formulation does not guarantee new-process design and evaluation. These counts describe traceable direct alignment; they are not a threshold, score, or independent method for assigning a PQF level, and the deliberately visible partial and no-alignment cells are what make the matrix discriminating rather than a self-confirming schedule.

Adjacent-level counterfactual and negative-case testing

An adjacent-level counterfactual test applied the exact 2026 PQF descriptors: removing the leadership, authoritative-influence, and new-system-design attributes carried by ILOs 1.4, 4.2, 4.4, 5.2, 5.4, 6.2–6.4, 7.4, and 8.1–8.4 leaves a role most consistent with Level 6, which cannot perform the complete specialization; conversely, requiring every holder to create frontier-advancing knowledge or field-defining work would satisfy Level 8 but is not demanded by the construct, so Level 8 is not justified by the present design. Eight negative and adversarial cases were each traced to a specific gate or decision rule, and the artifact rejected all eight without relying on aggregate-score compensation: a visually green project labelled NbS without biodiversity baseline or alternatives evidence is rejected under the NbS-credibility gate; a planner assuming responsibility for detailed hydraulic design beyond demonstrated competence is redirected to referral under the lawful-scope gate, since level cannot cure unlawful scope; an excellent team portfolio whose candidate cannot explain individual judgments or data provenance is rejected pending authenticated individual evidence; and high aggregate performance coexisting with unresolved displacement, inaccessible participation, or Indigenous-rights issues is rejected because rights are an award condition, not a bonus to be offset by strong scores elsewhere.

The remaining four cases test workload, credit, and level integrity: a hybrid system lacking exceedance, failure-mode, maintenance, and residual-risk decisions is rejected under the safety gate; a foundation-course certificate claimed as full specialization credit on the strength of attendance or title alone is not granted automatically, and demonstrated learning must instead be matched outcome-by-outcome under RPL/RPEL; a provider assigning a marketable credit total before tasks and representative successful-learner workload are measured has that credit deferred until workload is properly measured; and applied research that improves a local process but is represented as Level 8 frontier knowledge retains its Level 7 classification unless original frontier-advancing knowledge and a universal Level 8 role are separately required and evidenced. Taken together, the eight cases show that innovation, seniority, team output, and aggregate scores cannot substitute for lawful scope, authenticated individual competence, ecological credibility, rights protection, safety, and calibrated credit.

Comparator differentiation and scenario demonstrations

Comparator differentiation against the IUCN professional certificate, the UNEP NbS massive open online course, and World Bank Academy offerings found that none of the reviewed programs discloses the Philippine regulated-profession entry premise, the three-domain PQF analysis, programmatic assessment with non-compensable gates, or the CPSP–CATS/RPL governance that the proposed artifact requires; this establishes distinctiveness of purpose and evidentiary burden, not superiority or automatic recognition, and international courses may be accepted as prior learning only after outcome-by-outcome evidence assessment. Four scenario demonstrations tested whether one outcome architecture could support materially different Philippine contexts without prescribing a universal project type, each beginning with diagnosis and alternatives rather than a preferred intervention. In a coastal city facing storm surge, erosion, and mangrove degradation, the artifact directs a protection/restoration and retreat-or-accommodation portfolio with tenure and livelihood safeguards, and rejects a mangrove-only claim where hazard magnitude, sediment regime, or space makes residual risk unacceptable. In a riverine urban corridor with floodplain occupation and drainage constraints, it directs a connected floodplain, detention, and grey-system treatment train embedded in the land-use plan and investment program, and requires hydraulic capacity, exceedance, and relocation or tenure safeguards. In a dense heat-exposed district, it directs an equitable shade-and-cooling network across streets, parks, and buildings while rejecting beautification metrics alone in favor of measured thermal exposure, water demand, and displacement risk. In an upland growth center with slope instability and fragmented Indigenous and local tenure, it directs watershed protection, slope and riparian systems, and growth management, requiring rights processes and geotechnical and ecological evidence before road expansion or new development proceeds.

Validation argument and answers to the research questions

The analytical evidence supports four inferences: the construct is sufficiently represented for design because the 12 requirements and eight PPOs cover the identified professional work cycle; the outcome system is assessable in principle because each claim has identifiable evidence and tasks; the level claim is coherent because the complete role requires Level 7 strategic responsibility, critical synthesis, and new-

system design/evaluation while neither a reduced Level 6 role nor a universal Level 8 frontier role fits; and the legal boundary is defensible because planning leadership is separated from reserved detailed work and enforced through gates and referrals. Five stronger inferences remain unsupported by documentary evidence alone: that employers and communities need the role in exactly this form; that the 32 ILOs are exhaustive and feasible; that assessors will interpret rubrics consistently; that candidates can achieve the outcomes within a defensible workload and cost; and that competent authorities will approve the proposed title, level, credit, and registry status.

Read together, these findings answer the study's five research questions: the specialization requires a 12-domain evidence base; the lawful role comprises eight PPOs and 32 ILOs protected by six non-compensable gates; non-circular derivation is achieved by freezing outcomes before post hoc PQF coding; the complete artifact aligns most coherently with Level 7 across all three domains, with S3/S4 evidence deliberately bounded to ILO 8.3; and completed analytical verification—traceability, descriptor mapping, counterfactual and adversarial testing, comparator differentiation, and scenario demonstration—is distinct from, and does not substitute for, the occupational, stakeholder, assessment, workload, and regulatory validation that remains outstanding.

Pathway to recognition

Because a completed design-stage matrix is necessary but insufficient for recognition, the study specifies an eight-stage validation and recognition sequence rather than leaving adoption undefined. Accountable governance must first be constituted, with Professional Regulatory Board and CPSP–CATS oversight, conflict rules, version control, and representative participation. Occupational validation must then test public need, the role, entry premise, PPOs, ILOs, contexts, omissions, feasibility, and consequences, followed by community, rights-holder, and allied-professional boundary review. Assessment design must develop authentic tasks, rubrics, RPL/RPEL procedures, assessor criteria, moderation, accessibility arrangements, appeals, and records, which are then tested through piloting and independent evaluation using representative candidates and contexts. Only after tasks stabilize should typical successful-learner notional learning hours be measured by route and outcome to support an evidence-based credit recommendation, after which competent regulatory authorities determine the

recognized title, level, credit, providers, assessors, governance, and registration requirements. Implementation is then tracked through monitoring and periodic review, with correction triggered by adverse findings or material legal, standards, or practice change. Skipping stages to accelerate recognition would defeat the non-compensable logic that runs through the entire artifact.

Assessment and quality-assurance implications

Implementation should be organized around integrated performances rather than eight disconnected courses. Foundational study may establish concepts and legal literacy, but award evidence must involve authentic Philippine cases, multidisciplinary inputs, uncertainty, contested objectives, and consequential decisions; programmatic assessment should sample performance over time and settings, use analytic rubrics and exemplars, authenticate individual contribution, calibrate assessors, conduct sampled double scoring and independent moderation, provide accessibility arrangements, and maintain appeal and review mechanisms. Recognition of Prior Learning and Recognition of Prior Experiential Learning should be neither privileged nor penalized: prior learning must be judged against the same outcomes, complexity, evidence, and gates, and no accumulated credit should bypass the integrated Level 7 performance gate. For the evidence-monitoring outcome, assessors should evaluate the reasoning chain rather than reward the volume of monitoring data, defending intervention logic, measurement design, inference, uncertainty, decision threshold, authority, safeguards, and feedback, and penalizing overclaim, unsupported attribution, hidden rival explanations, and decisions beyond mandate.

Transferability and boundary conditions

The derivation-and-testing method may transfer to other professional specializations because it separates legal role, construct, evidence, level, credit, and recognition into discrete, independently testable stages. The substantive artifact itself is far less transferable: it is anchored in Philippine environmental-planning law, the 2026 PQF, PRC CPSP–CATS rules, national climate and biodiversity policy, and Philippine planning instruments, so adoption elsewhere would require new legal, occupational, ecological, institutional, and qualification analysis. Even within the Philippines, the same outcome architecture may operate differently across metropolitan, intermediate, small-city, coastal, riverine, upland, island, and rapidly urbanizing contexts, which is why the qualification

prescribes evidence standards and professional judgment rather than a universal project type. Local and Indigenous knowledge should be integrated through lawful, ethical, and non-extractive processes; it should not be reduced to a consultation checkbox or treated as freely appropriable evidence.

Original contribution

The study makes five bounded original contributions, presented collectively as components of the integrated artifact rather than as independent claims, and each novelty claim remains bounded to the documented search sources, dates, terms, and comparison set. First, it develops an integrated qualification for Philippine environmental planners that joins credible Nature-based Solutions, planning-level resilient urban design, professional law, assessment evidence, and the complete revised PQF Level 7 descriptors. Second, it establishes a derivation chain from public value and lawful professional role to construct, outcomes, evidence, non-compensable gates, and only then level assignment, rather than reasoning backward from a desired level. Third, it formulates a legally bounded conception of planning-level resilient urban design that enables spatial and policy leadership without appropriating detailed work reserved to allied professions. Fourth, it introduces the three-state necessary-entailment protocol that distinguishes complete, partial, and no alignment for every ILO-component relationship without treating counts as targets. Fifth, it develops the evaluability-to-decision protocol that separates observation, evaluative inference, authorized decision, and institutional feedback, and embeds that chain in the qualification's evidence and assessment architecture.

Contribution and limitations

Theoretically, the study offers an integrated public-value and social–ecological–technological conception of specialist planning practice, in which NbS credibility alone is insufficient without attention to urban form, institutions, finance, and rights, and RUD alone is insufficient if it treats nature as an aesthetic layer; the evaluability-to-decision framework further explains how evidence should influence professional action without equating monitored change with causal effectiveness. Methodologically, the principal contribution is the separation of derivation, coding, and validation—deriving the role and evidence from public need, construct, law, and practice; freezing the outcomes; coding them post hoc; and challenging the result through adjacent-level and adversarial tests—together with a documented evidence-appraisal

method, the three-state necessary-entailment rule, and the use of non-compensable gates to connect public-interest validity with assessment decisions. Professionally, the study gives planning-level RUD a defensible but bounded meaning within Republic Act No. 10587 and articulates a mainstreaming model in which NbS–RUD enters comprehensive land-use plans, zoning, investment programs, local climate and disaster-risk plans, and development review rather than remaining confined to individual project proposals.

The principal limitation is documentary endogeneity and researcher positionality: the qualification artifact was designed and analytically evaluated without an independent coder or external occupational panel, a risk mitigated but not eliminated through source-hierarchy discipline, frozen outcome wording, preserved negative cells, and adversarial and counterfactual testing. The scholarly search was bounded to the OpenAlex Works API and stated filters, so database coverage and indexing create omission risk, and the study is not a meta-analysis. The proposed qualification may also prove overbroad or underspecified relative to Philippine occupational reality, and assessment feasibility, rubric reliability, candidate workload, and accessibility remain unknown pending pilot evidence; analytical Level 7 fit does not itself create a legal title or award, and institutional validity depends entirely on competent-authority decisions that lie outside the scope of this study.

CONCLUSION

This study establishes a coherent design-stage basis for a Philippine professional specialization in Nature-based Solutions and Resilient Urban Design within environmental planning. Its contribution is not a new label for green projects; it is an integrated role–outcome–evidence–gate–matrix architecture grounded in current NbS standards, resilient urban planning and design scholarship, Philippine law, the 2026 PQF descriptors, CPSP–CATS policy, and assessment-validity theory. The documentary knowledge base is sufficient for qualification design under the disclosed appraisal criteria; eight PPOs and 32 ILOs represent the professional work cycle and all 12 design requirements; the proposed Level Alignment Matrix records 66 complete, 59 partial, and 131 no-alignment judgments across the three PQF domains, with every Level 7 descriptor component carrying at least one completely aligned outcome and complete design/evaluation evidence deliberately bounded to ILO 8.3; and adjacent-level and adversarial tests continue to reject Level 6 as

insufficient and Level 8 as excessive for the universal award standard.

The research is complete within its documented *ex ante*, documentary design-science scope; the qualification is not yet recognized or externally validated, and documentary and analytical rigor cannot substitute for representative occupational evidence, community and rightsholder participation, interprofessional review, task and rubric piloting, assessor reliability, workload measurement, and competent-authority action. Those requirements define the qualification's next validation and adoption stage rather than a defect in the present research.

Priority next steps follow directly from the findings. The proposed role, eight PPOs, 32 ILOs, evidence architecture, six gates, and Level Alignment Matrix should serve as the baseline for a representative occupational analysis spanning metropolitan, intermediate, small-city, coastal, riverine, upland, and island practice contexts, paired with rightsholder and community validation and a jointly reviewed interprofessional boundary protocol with architecture, landscape architecture, engineering, geodetic, and ecological practitioners. Programmatic assessment—tasks, rubrics, exemplars, assessor calibration, moderation, accessibility arrangements, and appeals—should be piloted before any credit is assigned, and typical successful-learner notional learning hours should be measured empirically rather than fixed from contact hours, consistent with PRC Resolution No. 2060's rule that credit reflects workload plus achieved outcomes rather than time alone. Recognition of Prior Learning and Recognition of Prior Experiential Learning should apply the identical outcomes, evidence, and gates as structured learning, and no accumulated credit should bypass the integrated Level 7 performance gate. All six non-compensable gates should remain non-negotiable throughout this process: no aggregate score should be permitted to cure unlawful scope, inauthentic evidence, ecological failure, a rights violation, unsafe residual risk, or the absence of demonstrated individual competence. Finally, the qualification's title, PQF level, credit, provider authority, and Philippine Qualifications Register status should not be publicly represented as established until the appropriate Professional Regulatory Board and Professional Regulation Commission instruments and registry actions are in place, and an implementation research and periodic-review system should track assessment decisions, access, cost, professional-boundary effects, and ecological and equity outcomes once the qualification is piloted.

In sum, the research has completed the construction, demonstration, and ex ante analytical evaluation of a Level Alignment Matrix for a proposed PQF Level 7 post-licensure specialization in Nature-based Solutions and Resilient Urban Design within environmental planning. The three-state results establish coherent integrated Level 7 alignment while preserving residual partial and no-alignment judgments, and the evaluability-to-decision protocol strengthens the evidence, inference, and adaptive-decision architecture without conferring project authority or substituting for external validity. The manuscript therefore supports two simultaneous conclusions: the bounded documentary design-science study is complete, and the qualification remains a proposed research artifact that must undergo independent occupational, stakeholder, interprofessional, assessment, workload, consequential, institutional, and regulatory validation before recognition or award.

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