Global Academic Journal of Economics and Business

Available online at https://www.gajrc.com
DOI: https://doi.org/10.36348/gajeb.2026.v08i04.012

OPEN ACCESS

ISSN: 2706-9001 (P)
ISSN: 2707-2584 (O)

Original Research Article

Sustainable Construction Practices for Tourism Infrastructure in Saudi Arabia: Integrating Quality Assurance, Risk Control, and Environmental Compliance

Waqar Hussnain[1*]
[1]Research Scholar, Projects Director and Construction Project Management Professional, Kingdom of Saudi Arabia

***Corresponding Author**
Waqar Hussnain
Research Scholar, Projects Director and Construction Project Management Professional, Kingdom of Saudi Arabia

Article History
Received: 25.05.2026
Accepted: 13.07.2026
Published: 17.07.2026

Abstract: Saudi Arabia's tourism infrastructure programme is reshaping the construction sector through destination-scale projects that combine luxury hospitality, mobility, utilities, housing, public realm, coastal conservation and worker-community services. Under Vision 2030, tourism infrastructure is not only a matter of asset delivery; it is also a national diversification mechanism that must support environmental stewardship, visitor experience, operational resilience and long-term regional value. This review paper examines sustainable construction practices for tourism infrastructure in Saudi Arabia with particular attention to the integrated role of quality assurance, risk control and environmental compliance. A narrative review approach was used to synthesize recent construction management, sustainable tourism, digital delivery and environmental governance literature from 2020 onward, supported by public information on Saudi Vision 2030 and Red Sea Global's regenerative tourism agenda. The review finds that sustainable tourism construction depends on treating quality, risk and environmental requirements as mutually reinforcing systems rather than separate departmental controls. Quality assurance reduces rework, protects operational performance and converts design intent into verifiable installation evidence. Risk control enables early attention to logistics, interface, climate, procurement and stakeholder uncertainties. Environmental compliance protects sensitive coastal and desert ecosystems through permit discipline, waste and water controls, biodiversity monitoring and responsible material choices. The paper proposes a lifecycle stage-gate framework that aligns strategic briefs, design approvals, procurement, construction, testing, handover and operations feedback. The study contributes a practical governance model for project directors, consultants, contractors and regulators working on sustainable tourism assets in Saudi Arabia and comparable emerging destinations.

Keywords: Saudi Vision 2030, Sustainable Construction, Tourism Infrastructure, Quality Assurance, Risk Control, Environmental Compliance, Red Sea Global, Project Governance, Sustainable Tourism, Construction Management.

Citation: Waqar Hussnain (2026). Sustainable Construction Practices for Tourism Infrastructure in Saudi Arabia: Integrating Quality Assurance, Risk Control, and Environmental Compliance; *Glob Acad J Econ Buss, 8*(4), 692-701.

1. INTRODUCTION

Saudi Arabia is using tourism infrastructure as one of the visible mechanisms for economic diversification, regional development and global destination branding. The expansion of resorts, airports, mobility corridors, worker villages, utilities, public realm and hospitality-support facilities creates a construction environment that is far more complex than conventional vertical building delivery. Tourism assets must be attractive to visitors, safe for workers and operators, compatible with cultural and environmental settings, resilient to climate conditions, and capable of being maintained after opening. This makes sustainable construction a strategic delivery requirement rather than a branding addition. In the Saudi context, the connection between Vision 2030 and tourism is especially strong because national transformation relies on new sectors that increase private investment, employment, quality of life and international visibility (Vision 2030, 2025; Iqbal & Aftab, 2025).

Red Sea Global demonstrates how this shift is being translated into destination-scale development. Its public material presents The Red Sea as a regenerative tourism destination with planned hotels, renewable-energy systems, biodiversity protection and a development philosophy that seeks social, environmental and economic value (Red Sea Global, 2026a, 2026b; Public Investment Fund, 2026). These ambitions create a demanding project-management setting. A construction package is not successful simply because it is delivered on time and within budget. It must also provide evidence that designs have been controlled, materials are compliant, interfaces are coordinated, environmental commitments are protected, and handover documentation enables reliable operation. In tourism environments, poor workmanship, unclosed nonconformance, unmanaged waste, weak worker-safety controls or late stakeholder approvals can affect guest experience and destination reputation as much as they affect cost.

The profile of Saudi giga-project delivery also increases the need for integrated governance. Large programmes involve multi-tier contracting, design revisions, remote locations, specialist hospitality finishes, marine and desert ecosystems, international consultants, local authorities, client representatives and future operators. In such settings, quality assurance, risk management and environmental compliance are often managed by different teams, with separate registers and reporting cycles. This separation can hide causal relationships. A delayed mock-up can create procurement risk; a design change can affect permit obligations; rushed finishing work can raise HSE and quality risks; and late environmental approvals can disrupt sequence, access or logistics. Sustainable construction therefore requires a project-control system that identifies how these dimensions interact over the full lifecycle.

This paper reviews sustainable construction practices for tourism infrastructure in Saudi Arabia by focusing on three connected controls: quality assurance, risk control and environmental compliance. The objective is to build a practical framework that project directors, construction managers, consultants and contractors can use when delivering destination assets aligned with Vision 2030. The review does not claim to present confidential project data. Instead, it combines public national and project context with recent construction-management literature and the professional realities of large Saudi construction programmes. The central argument is that sustainable tourism construction is achieved when quality, risk and environmental requirements are embedded in decisions from strategic brief to operations feedback, rather than being inspected only at the end of construction.

2. LITERATURE REVIEW AND CONCEPTUAL BACKGROUND

Sustainable construction has evolved from a narrow focus on material efficiency and energy use to a broader delivery model that covers lifecycle value, worker welfare, carbon, biodiversity, circularity, resilience and social acceptance. The buildings and construction sector remains a major contributor to energy demand and emissions globally, which has increased pressure on owners and contractors to adopt low-carbon materials, efficient design, digital coordination and waste reduction (UNEP, 2024; WorldGBC, 2023). In tourism infrastructure, the sustainability challenge is even more visible because the built assets are part of the destination experience. A hotel, marina, airport, golf clubhouse or public realm package must perform as a physical asset and as a symbol of responsible development.

Tourism-related construction in Saudi Arabia is shaped by national diversification targets and by the specific environmental conditions of coastal and desert regions. Recent tourism research links Saudi Vision 2030 with employment, economic resilience, destination diversification and sustainable growth (Iqbal & Aftab, 2025). However, rapid tourism expansion also requires governance that prevents environmental pressure, infrastructure imbalance and inconsistent service quality. The Red Sea destination illustrates this tension. Public sources describe development limits, renewable energy, water management, waste reduction, coral and

mangrove restoration, and a target to generate conservation benefit while delivering luxury hospitality (Red Sea Global, 2026b; Public Investment Fund, 2026). These priorities imply that construction teams must translate environmental strategy into site-level controls such as access protection, material logistics, waste segregation, method statements, inspection points and closeout evidence.

Quality assurance is a core mechanism for this translation. In construction management, quality is not limited to final inspection. It begins with design reviews, specifications, shop drawings, method statements, inspection and test plans, material approvals, mock-ups, factory inspections, site inspections, nonconformance management, testing, commissioning and defects closeout. For tourism assets, quality failures can affect guest safety, brand perception, durability and maintenance cost. The value of QA increases when it is connected to digital document management, BIM coordination and lessons learned. ISO 9001 principles remain relevant because they emphasise process approach, evidence-based decision-making and continual improvement; however, tourism construction requires these principles to be operationalised through project-specific controls and client expectations (ISO, 2015a; PMI, 2021).

Risk control provides the second pillar. Saudi construction research has identified time and cost overrun factors related to scope changes, payment issues, planning weaknesses, resource availability and coordination failures (Alshihri *et al*., 2022). In destination programmes, risk exposure also includes remote logistics, climate, marine interfaces, limited access roads, seasonal tourism opening dates, international supply chains, evolving operator requirements, regulatory approvals and interface dependency between packages. Risk management is therefore more effective when it is continuous, transparent and connected to schedule, procurement and quality evidence. A risk register that is not linked to programme milestones can become a static formality; conversely, a register linked to early-warning triggers, mitigation owners and closeout criteria can support executive decisions before risk becomes delay.

Environmental compliance is the third pillar. It includes legal obligations, environmental impact assessment commitments, permit requirements, biodiversity protection, pollution prevention, carbon and energy targets, water stewardship, waste hierarchy and emergency response. ISO 14001 principles are useful because they link environmental planning to operational control, performance evaluation and continual improvement (ISO, 2015b). For tourism infrastructure, compliance must be more than a checklist. It should function as a design and construction constraint that affects where temporary facilities are located, how materials are stored, how waste is separated, how water is managed, how workers access sensitive areas, and how handover information supports long-term operations.

The literature increasingly shows that digital tools can connect these pillars. BIM and common data environments improve coordination and can support quality control, visual review, clash detection, asset information and handover. AR/VR and BIM-assisted review have also been discussed as tools for construction visualization and quality assurance (Yigitbas *et al*., 2023). Digital systems are not a substitute for site leadership, but they can reduce ambiguity by maintaining a single source of truth for submittals, design changes, inspections and handover records. For Saudi tourism projects, where multiple international and local parties work across large geographic footprints, digital governance is essential to convert sustainability commitments into auditable delivery evidence.

3. METHODOLOGY

This paper uses a narrative review methodology. A narrative review is appropriate because the topic combines construction management, tourism development, environmental governance, quality systems and risk-control practice. Rather than testing a single hypothesis, the aim is to synthesize current knowledge and propose a practical framework for Saudi tourism infrastructure. The review covered four evidence streams. First, public policy and project sources were examined to understand the Vision 2030, Red Sea Global and PIF context. Second, construction-management literature from 2020 onward was reviewed to identify recurring risks, quality issues and digital-delivery practices. Third, sustainability and built-environment reports were considered to position the work within global decarbonization and lifecycle-performance debates. Fourth, recognised management standards were used as conceptual anchors for quality, environmental and project-control principles.

The scope was limited to tourism infrastructure and supporting civil/construction packages rather than hospitality operations after opening. This includes resorts, public realm, clubhouses, worker and staff facilities, roads, utilities, mobility assets, landscaping, environmental protection works and destination services. The review prioritised sources that are relevant to Saudi Arabia, Vision 2030, sustainable tourism, sustainable construction, BIM-enabled controls, project risk, quality assurance and environmental compliance. Sources were interpreted through a project-delivery

lens, asking how each theme affects decisions made by project directors, construction managers, consultants, contractors and client representatives.

The synthesis was carried out in three steps. First, recurring practices were grouped into the three domains of quality assurance, risk control and environmental compliance. Second, links between these domains were mapped across lifecycle stages from strategic brief to operations feedback. Third, the resulting patterns were converted into a framework with stage-gate controls and measurable indicators. This method is suitable for a review paper intended to support professional application in Saudi Vision 2030 projects because it turns diverse literature into a governance structure that can be adapted to different packages and contracting models.

4. Sustainable Construction Practices for Tourism Infrastructure

Sustainable construction practices begin at the strategic brief. For tourism infrastructure, the brief should define not only capacity, function, budget and schedule, but also sustainability outcomes, environmental constraints, visitor-experience requirements, operator standards, local-content goals and handover data needs. Early definition matters because later construction decisions are constrained by the assumptions made during concept and design. A resort or public-realm package located near sensitive habitats, for example, requires early agreement on access routes, temporary facilities, noise, light, dust, waste, water use and emergency response. When these issues are addressed only during construction, they usually become cost and schedule risks. When they are incorporated into the brief and design reviews, they become manageable constraints.

Material selection is a central practice. Sustainable tourism infrastructure should prefer materials that meet specification, durability and environmental criteria. This can include low-carbon concrete alternatives where technically approved, recycled content, responsibly sourced timber, corrosion-resistant systems for coastal exposure, modular components that reduce waste, and locally available materials that reduce transport impacts. However, sustainability should not be interpreted as accepting unproven products without quality evidence. A sustainable material must satisfy design performance, safety, maintainability and compliance requirements. For this reason, material approval workflows should include technical submittals, environmental product information where available, supplier capacity assessment and installation mock-ups.

Construction sequencing also affects sustainability. Efficient sequence planning reduces idle resources, unnecessary rework, fuel use, waste and HSE exposure. Tourism projects often face milestone pressure because opening dates, marketing commitments and seasonal demand create fixed deadlines. Under such pressure, a poor sequence can force parallel work fronts, congestion, excessive overtime and lower quality. A sustainable sequence is realistic, trade-coordinated and supported by procurement readiness. It should connect master schedules with inspection readiness, environmental permits and access control. Primavera P6 or similar scheduling tools can help, but the value comes from disciplined integration of schedule logic with quality and environmental gates.

Waste and water practices are particularly important in remote or ecologically sensitive destinations. Sustainable construction should apply the waste hierarchy: avoid, reduce, reuse, recycle and dispose responsibly. Site teams need clearly marked segregation areas, approved waste contractors, tracking records and training for subcontractors. Water management requires control of potable use, dust suppression, washout areas, wastewater handling, erosion protection and emergency spill response. In coastal settings, runoff control and marine protection are crucial because small failures can affect biodiversity and reputation. These practices are not only environmental; they are also project-control practices because violations can lead to stoppages, rework, penalties and stakeholder concerns.

Worker welfare and HSE complete the sustainability picture. Tourism infrastructure is often built in remote areas where accommodation, transport, heat exposure, medical access and emergency response require careful planning. A site that promotes environmental sustainability but neglects worker welfare is not truly sustainable. Heat-stress controls, safe access, lifting plans, temporary works checks, emergency drills, welfare facilities and supervisor competence should be connected to both HSE and quality performance. Fatigue, congestion and poor supervision often produce defects and incidents together. Therefore, sustainability governance should treat HSE and quality as mutually reinforcing outcomes of a well-planned construction system.

Table 1: Sustainable construction practices for Saudi tourism infrastructure

Practice area	Core controls	Sustainability value	Evidence to retain
Strategic brief and design	Sustainability outcomes, constructability review, environmental constraints, operator requirements	Prevents late redesign and aligns guest experience with environmental limits	Brief, design-review minutes, permit matrix, sustainability requirements register
Material and supplier approval	Technical submittals, mock-ups, supplier screening, low-carbon or durable material options	Reduces rework, transport impacts and lifecycle maintenance burdens	Material approvals, test certificates, EPDs where available, sample approvals
Construction sequencing	Logic-linked schedule, access plan, trade coordination, inspection readiness	Reduces congestion, idle resources, HSE exposure and quality defects	Updated programme, look-ahead plans, readiness checklists, progress dashboards
Waste and water control	Waste segregation, approved disposal, washout zones, water-use monitoring, spill response	Protects site environment and reduces resource intensity	Waste tickets, water logs, inspection reports, incident closeout records
Worker welfare and HSE	Heat-stress plan, safe access, welfare facilities, lifting controls, emergency drills	Supports social sustainability and reduces incident-related delay	Training records, inspection reports, toolbox talks, medical/emergency records

5. Integrating Quality Assurance

Quality assurance in tourism infrastructure must protect both technical compliance and destination experience. Technical compliance includes structural performance, fire and life safety, waterproofing, MEP coordination, finishes, accessibility, durability and commissioning. Destination experience includes the appearance, comfort, reliability and maintainability expected by visitors and operators. The QA system should therefore begin with clear quality objectives tied to the employer's requirements, operator standards and environmental commitments. These objectives should be translated into inspection and test plans, mock-up approval procedures, sample panels, material submittals, method statements and acceptance criteria.

A strong QA model is preventive rather than reactive. Preventive QA requires constructability reviews before work begins, coordinated shop drawings, BIM clash checks, approved method statements and pre-activity briefings. It also requires early engagement between design, procurement, construction, quality and environmental teams. For example, facade or waterproofing works in a coastal resort environment should be reviewed for material compatibility, installation sequence, access method, inspection hold points, weather sensitivity and maintenance implications. If QA is applied only through final inspection, problems are discovered after value has already been lost. If QA is applied through stage gates, defects are prevented before they become visible.

Nonconformance management is a critical indicator of maturity. A nonconformance report should not be treated as an administrative burden; it is a learning opportunity and a risk signal. High numbers of repetitive NCRs may indicate unclear drawings, poor subcontractor capability, weak supervision, unsuitable materials or unrealistic schedule pressure. NCR trends should therefore be reviewed with risk and planning teams. Closure should require root-cause analysis, corrective action, preventive action and evidence of implementation. This creates a feedback loop between quality and risk control.

Digital document management strengthens QA by creating traceability. Common data environments and PMIS platforms can record submittals, RFIs, inspections, NCRs, test results, commissioning certificates and handover documents. In tourism infrastructure, traceability is essential because assets move from construction to hospitality operation where maintenance teams need reliable information. A complete handover package should include as-built drawings, warranties, operation manuals, test certificates, commissioning records, environmental records and training evidence. The value of QA therefore continues beyond practical completion; it protects operational readiness and reduces lifecycle cost.

6. Integrating Risk Control

Risk control in Saudi tourism infrastructure must deal with both conventional construction risks and destination-specific uncertainties. Conventional risks include scope change, design delay, late approvals, procurement delays, labour shortages, subcontractor performance, cash flow, rework and HSE incidents. Destination-specific risks include remote logistics, marine and coastal restrictions,

climate exposure, environmental permits, interface dependency between resorts and utilities, evolving operator requirements, limited specialist suppliers and reputational sensitivity. Research on Saudi construction overruns reinforces the importance of planning, resource management, cost control and communication (Alshihri *et al*., 2022).

A practical risk-control system should be linked to the work breakdown structure and schedule. Each major package should have a risk register that identifies cause, event, impact, owner, mitigation, trigger date and residual exposure. Risks should not be hidden in generic categories. For example, 'procurement delay' is less useful than 'late approval of coastal corrosion-resistant fixing system may delay facade installation and increase rework risk.' The second statement provides a specific cause, affected work front and mitigation path. Effective risk language allows management to intervene early.

Interface risks deserve special attention. Tourism destinations are systems of systems: roads depend on utilities; resorts depend on power and water; public realm depends on grading and landscaping; finishing works depend on enclosure and climate control; commissioning depends on MEP readiness; environmental compliance depends on access and sequencing. A delay in one package can cascade into another. Interface matrices, weekly coordination meetings, BIM-based coordination, dependency mapping and executive dashboards help manage these risks. The project director's role is to ensure that interface decisions are escalated before they become disputes.

Risk control is also connected to environmental and quality performance. A rushed programme can increase defects, waste and HSE exposure. A late design change can invalidate prior environmental assumptions. Poor procurement can introduce noncompliant materials. Climate risks such as heat, wind, dust and coastal humidity can affect productivity, safety and material performance. These relationships show why sustainable construction needs integrated dashboards rather than separate reports. When quality, HSE, procurement, environmental and schedule data are reviewed together, management can detect weak signals earlier.

Contingency planning should be transparent and disciplined. Contingency is not only a budget line; it is a governance mechanism. High-impact risks should have defined response strategies, decision thresholds and owner accountability. For example, a long-lead equipment risk may require alternative suppliers, early factory inspection, air-freight scenarios and commissioning resequencing. An environmental access risk may require alternative temporary routes, regulator engagement and revised method statements. Risk reviews should therefore focus on decisions, not only status updates.

7. Integrating Environmental Compliance

Environmental compliance gives sustainable tourism infrastructure its legitimacy. In a sensitive destination, compliance must address the full chain from design commitments to construction controls and operational handover. Environmental impact assessment conditions, permit requirements, biodiversity protection plans, waste-management plans, erosion and sediment controls, water-management procedures, spill-response plans and monitoring reports should be treated as binding project requirements. They should be visible in procurement packages, method statements, site inductions and inspection plans.

Biodiversity protection is central to regenerative tourism. Red Sea Global's public description of The Red Sea highlights conservation benefit, coral and mangrove restoration, development limits, renewable energy and zero-waste initiatives (Red Sea Global, 2026b). Translating this level of ambition into construction practice requires clear exclusion zones, controlled access, worker training, lighting controls where required, dust suppression, noise management, marine protection, wildlife reporting and restoration records. The construction team should understand that environmental controls protect both ecosystems and project reputation.

Waste management should be measured, not only instructed. Project teams should track waste volume by category, recycling rate, disposal contractor approvals, hazardous-waste manifests and noncompliance trends. The same principle applies to water use and pollution prevention. Water consumption for dust suppression, curing and welfare should be monitored. Concrete washout, chemical storage, fuel handling and maintenance areas should be controlled through inspections and emergency response readiness. These controls reduce environmental risk while improving site discipline.

Carbon and energy considerations are increasingly relevant. While detailed carbon accounting may depend on client requirements and data availability, construction teams can support lower emissions through efficient logistics, reduced rework, material optimization, prefabrication, equipment maintenance, renewable temporary power where feasible and procurement decisions that consider lifecycle impacts. Digital coordination and QA help carbon performance indirectly by

reducing demolition, replacement and repeated deliveries. This illustrates again that sustainability is not a single department but a set of choices embedded in everyday project control.

Environmental compliance also requires communication with stakeholders. Regulators, clients, consultants, local communities, operators and workers may have different concerns. A transparent compliance system should provide evidence, not assumptions. Permit matrices, inspection logs, environmental incident reports, corrective actions, photographs, GIS/BIM-linked records and periodic dashboards can demonstrate control. Such evidence is essential in high-profile tourism destinations because public trust depends on confidence that development is managed responsibly.

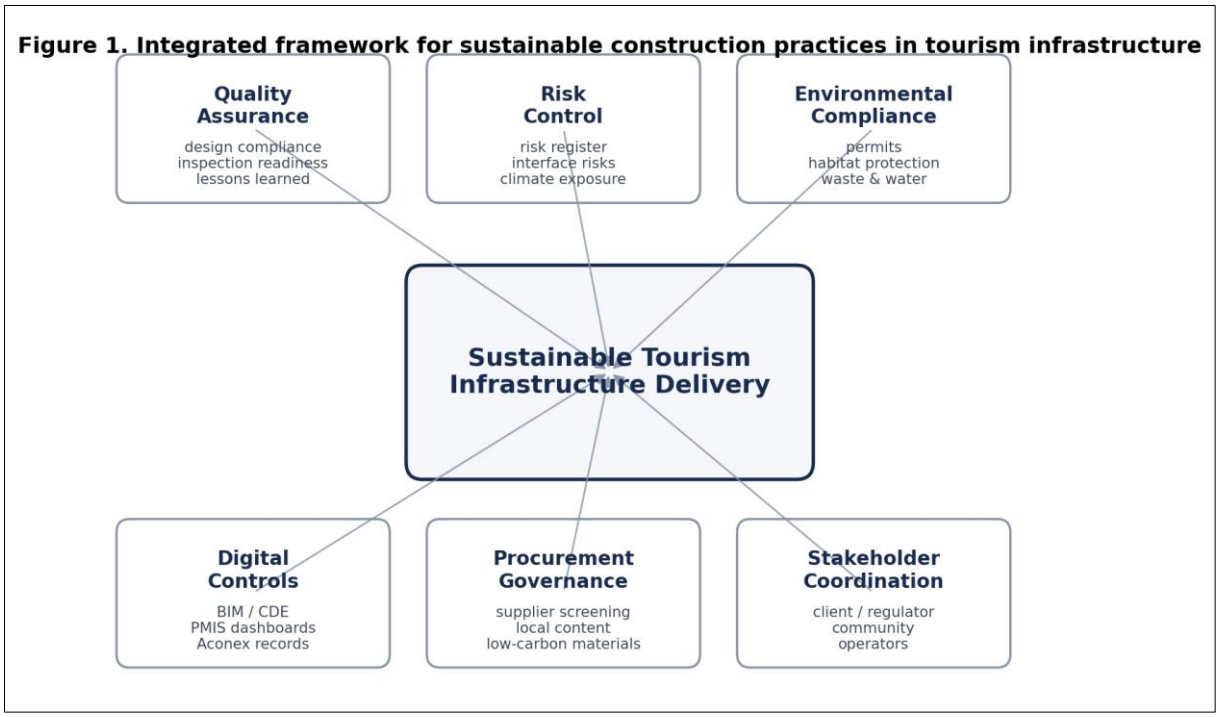

Figure 1: Integrated framework for sustainable construction practices in tourism infrastructure

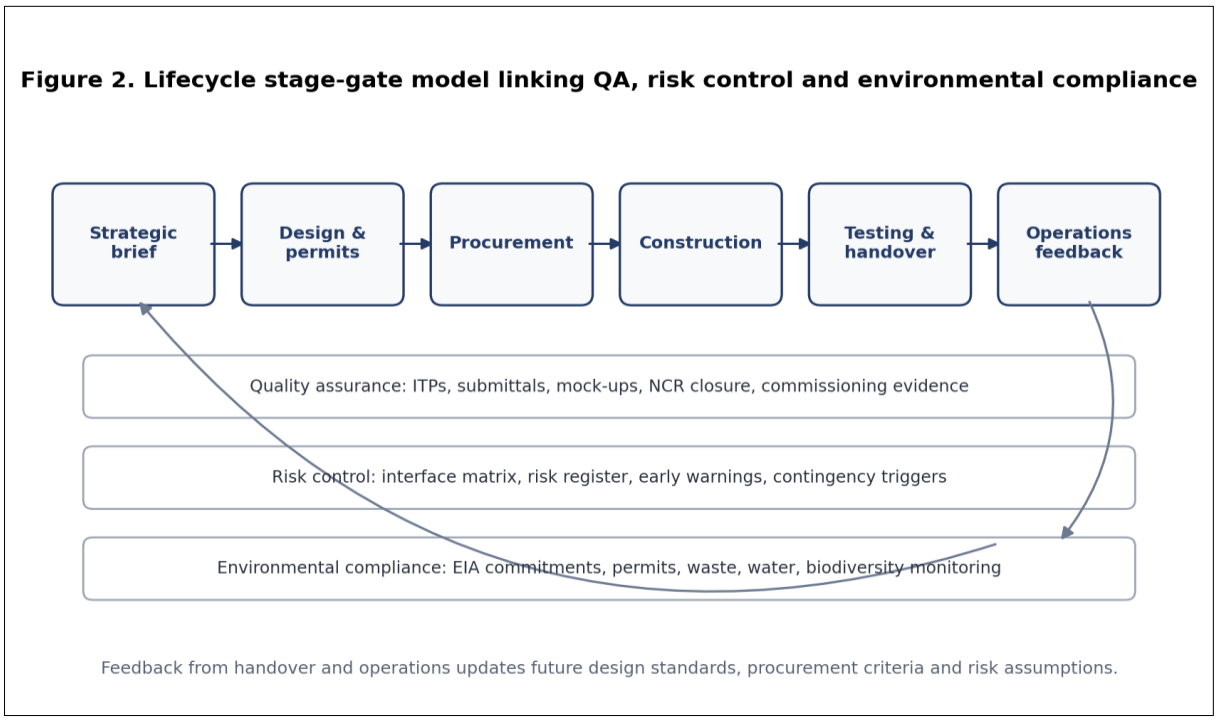

Figure 2: Lifecycle stage-gate model linking QA, risk control and environmental compliance

8. Proposed Lifecycle Framework

The review suggests that sustainable tourism construction can be managed through a lifecycle stage-gate framework. The first gate is the strategic brief, where sustainability outcomes, environmental constraints, quality standards, risk appetite and handover data requirements are defined. The second gate is design and permits, where environmental commitments, constructability reviews, BIM coordination and authority approvals are aligned. The third gate is procurement, where supplier capability, material compliance, environmental documentation and delivery risk are reviewed before award. The fourth gate is construction, where ITPs, method statements, HSE controls, environmental inspections and risk mitigations are implemented. The fifth gate is testing and handover, where commissioning, as-built records, closeout evidence and operator training are verified. The final gate is operations feedback, where lessons learned from maintenance, guest experience and environmental monitoring update future standards.

This framework has two important features. First, it treats QA, risk and environmental compliance as parallel governance bands across every stage. A design decision is not approved only for aesthetics or cost; it is also tested against quality, risk and environmental consequences. A procurement decision is not made only for price; it is checked for supplier capability, compliance evidence and schedule resilience. A handover decision is not accepted only because construction is complete; it is assessed against commissioning performance, documentation quality and operational readiness. Second, the framework creates feedback from operations into future projects. Tourism infrastructure is repeated across destinations, islands, resorts and facilities. Each completed package should improve the next one through lessons learned.

The framework is especially relevant to project directors and senior construction managers. Their role is not to personally inspect every item, but to build a decision environment where the right information reaches the right level at the right time. This includes integrated dashboards, escalation rules, clear accountability, cross-functional reviews and disciplined closeout. In a Vision 2030 tourism project, leadership must connect national ambition with site execution. That connection is achieved through governance routines that convert sustainability values into measurable construction behaviours.

Table 2: Integrated indicators for QA, risk control and environmental compliance

Lifecycle stage	QA indicator	Risk-control indicator	Environmental indicator	Management decision
Strategic brief	Quality objectives approved	Risk appetite defined	Environmental constraints mapped	Approve delivery strategy
Design and permits	Design review comments closed	Interface risks assigned	Permit matrix current	Freeze design basis for procurement
Procurement	Materials technically approved	Long-lead risks mitigated	Supplier environmental evidence checked	Release purchase orders
Construction	ITP pass rate and NCR trends reviewed	Early warnings escalated	Waste, water and habitat inspections current	Adjust sequence or resources
Testing and handover	Commissioning and defects closeout verified	Residual risks transferred or closed	Environmental closeout records complete	Accept handover package
Operations feedback	Defects and maintainability reviewed	Lessons learned updated	Monitoring data reviewed	Update future standards

9. Practical Implications

For project owners and developers, the main implication is that sustainability targets should be embedded into contracts, specifications, reporting templates and stage-gate approvals. General sustainability language is not enough. Contractors need measurable requirements related to material approvals, waste, water, biodiversity, quality records, digital documentation, HSE performance, risk reporting and handover. Owners should also avoid creating delivery pressure that undermines sustainability. Unrealistic deadlines can push contractors toward shortcuts, rework and unsafe practices. Sustainable delivery requires ambition and feasibility to be managed together.

For contractors, the implication is that competitiveness increasingly depends on governance capability. Contractors delivering tourism infrastructure in Saudi Arabia need more than manpower and equipment. They need competent planning teams, quality engineers, environmental

officers, HSE leadership, procurement controls, BIM coordination, document control and disciplined subcontractor management. A contractor that can provide accurate records, early warnings, clean handover evidence and responsible site controls offers strategic value to developers.

For consultants and supervision teams, the implication is that review processes should be timely, consistent and risk-based. Delayed submittal approvals or unclear comments can become construction risks. Consultants should prioritise high-risk items and coordinate technical, quality and environmental comments so that contractors receive actionable direction. For regulators and public-sector stakeholders, the framework supports transparent evidence of compliance and helps align development with Vision 2030 sustainability and tourism goals.

For Saudi Premium Residency researcher alignment, this topic is strong because it connects the applicant's construction leadership experience with national priorities in sustainable infrastructure, tourism development, project governance and environmental stewardship. It demonstrates applied professional knowledge rather than generic management theory. It also supports the case that the applicant can contribute to the sustainable delivery of Vision 2030 projects through research, leadership and practical project-control expertise.

10. Limitations and Future Research

This paper has limitations. It is a narrative review and conceptual framework, not an empirical case study using confidential project records. It relies on public sources and published literature, so it cannot quantify actual performance on specific construction packages. Future research could test the framework through interviews with project directors, consultants, contractors, environmental managers and operators working on Saudi tourism projects. It could also develop quantitative indicators linking QA maturity, risk-control performance and environmental compliance to cost, schedule, carbon, waste, rework and operational-readiness outcomes.

Further studies could compare coastal, desert and urban tourism infrastructure because each setting has different environmental and logistics risks. Research could also examine the role of BIM, digital twins, AI-assisted risk analytics and mobile inspection tools in improving sustainability evidence. Another useful direction is to study how Saudi contractors can build capability in green procurement, lifecycle costing and environmental documentation. As Vision 2030 projects mature, lessons from completed assets will become increasingly valuable for improving future programmes.

11. CONCLUSION

Sustainable construction practices for tourism infrastructure in Saudi Arabia require an integrated approach that connects quality assurance, risk control and environmental compliance across the full project lifecycle. Vision 2030 has created a delivery environment where tourism assets must support economic diversification, destination excellence, environmental protection and long-term operational value. Red Sea Global's regenerative tourism context demonstrates that sustainability ambitions must be converted into practical site controls, procurement choices, inspection evidence, risk decisions and handover readiness.

The review shows that quality assurance prevents rework and protects destination experience; risk control enables early management of uncertainty; and environmental compliance protects ecosystems, permits, reputation and stakeholder trust. These domains cannot be managed effectively as isolated functions. They must be linked through stage gates, integrated dashboards, cross-functional reviews and operations feedback. The proposed framework offers a practical structure for owners, consultants, contractors and project leaders working on Saudi tourism infrastructure. By embedding sustainability into daily construction governance, Saudi Arabia can strengthen the delivery of tourism destinations that are not only built to impress, but built to endure, regenerate and support Vision 2030's wider transformation goals.

REFERENCES

- Al-Otaibi, A., Almutairi, F., & Sadiq, M. (2025). Barriers to sustainable building project performance in developing construction markets. Sustainability, 17(8), 3539.
- Alshihri, S., Al-Gahtani, K., & Almohsen, A. (2022). Risk factors that lead to time and cost overruns of building projects in Saudi Arabia. Buildings, 12(7), 902.
- Bortoli, A. de, Baouch, Y., & Masdan, M. (2022). BIM can help decarbonize the construction sector: Life cycle evidence from pavement management systems. arXiv preprint arXiv:2210.12307.
- Ellen MacArthur Foundation. (2021). Circular economy in the built environment: Opportunities for better design and material flows.
- Global Reporting Initiative. (2021). GRI Standards 2021: Consolidated set of sustainability reporting standards.
- International Energy Agency. (2023). Buildings: Energy system overview and transition indicators.

- International Labour Organization. (2022). Enhancing occupational safety and health in construction.
- International Organization for Standardization. (2015a). ISO 9001:2015 Quality management systems - Requirements.
- International Organization for Standardization. (2015b). ISO 14001:2015 Environmental management systems - Requirements with guidance for use.
- International Organization for Standardization. (2018). ISO 45001:2018 Occupational health and safety management systems - Requirements with guidance for use.
- International Organization for Standardization. (2020). ISO 19650-3:2020 Organization and digitization of information about buildings and civil engineering works, including building information modelling.
- Iqbal, T., & Aftab, F. (2025). Exploring tourism's contribution to Saudi Arabia's Vision 2030: Aligning with UN SDG 8 for sustainable growth. International Journal of Sustainable Development and Planning, 20(3), 1283-1289.
- McKinsey Global Institute. (2020). The next normal in construction: How disruption is reshaping the world's largest ecosystem.
- Ministry of Tourism, Saudi Arabia. (2024). Tourism sector strategy and development updates.
- Project Management Institute. (2021). A guide to the project management body of knowledge (PMBOK Guide) (7th ed.).
- Public Investment Fund. (2026). The Red Sea: Sustainability initiatives and regenerative tourism destination profile.
- Red Sea Global. (2026a). About Red Sea Global: Shaping a better future for people and planet.
- Red Sea Global. (2026b). The Red Sea: A regenerative tourism destination.
- Red Sea Global. (2026c). Responsible development and the A-Z of regenerative tourism.
- Research and Development and Innovation Authority. (2025). National priorities for research, development and innovation in Saudi Arabia.
- Saudi Green Building Forum. (2026). Sustainable construction practices and green building support in the Kingdom of Saudi Arabia.
- Saudi Green Initiative. (2025). Saudi Green Initiative targets and sustainability programmes.
- Saudi Standards, Metrology and Quality Organization. (2024). Saudi quality infrastructure and standards guidance for construction materials.
- United Nations Environment Programme. (2024). Global status report for buildings and construction 2024/2025.
- United Nations World Tourism Organization. (2023). Achieving the Sustainable Development Goals through tourism.
- Vision 2030. (2025). Red Sea Global project profile and national transformation context.
- World Bank. (2021). Climate-smart infrastructure for sustainable development.
- World Green Building Council. (2023). Advancing net zero and sustainable built environment transformation.
- Yigitbas, E., Nowosad, A., & Engels, G. (2023). Supporting construction and architectural visualization through BIM and AR/VR: A systematic literature review. arXiv preprint arXiv:2306.12274.
- Zavadskas, E. K., Turskis, Z., & Antucheviciene, J. (2020). Sustainable construction decision-making and risk assessment in complex built-environment projects. Sustainability, 12(24), 10314.

