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Safety Governance as a Driver of Sustainable Regional Development in Saudi Arabia's Tourism Infrastructure Projects

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Abstract- ***Saudi Arabia's tourism infrastructure pipeline is central to Vision 2030, yet the same scale that enables destination transformation also concentrates occupational, environmental, reputational and community risks. This review examines safety governance as a strategic driver of sustainable regional development in tourism infrastructure projects, including destination cities, coastal resorts, heritage districts, mobility links, utilities, entertainment assets and enabling worker accommodation. Drawing on peer reviewed literature and policy evidence published between 2020 and 2025, the paper develops an integrated framework linking safety governance to productivity, destination confidence, regional employment, social licence and environmental stewardship. A structured narrative review method was used to synthesize studies on Saudi construction safety, tourism governance, mega-project risk, occupational heat exposure, sustainable destination management and global safety standards. The review finds that safety performance is not merely a compliance outcome; it is a development capability that affects project continuity, investor assurance, local acceptance and the long term competitiveness of emerging regions such as Tabuk, AlUla, the Red Sea coast, Riyadh and the western pilgrimage corridor. Four governance pathways are identified: regulatory alignment, contractor accountability, digital evidence systems and place-based worker welfare. The study contributes a safety-governance nexus for Saudi tourism infrastructure and proposes practical indicators for project sponsors, public agencies and contractors. It concludes that sustainable regional development requires safety to be embedded from feasibility and design through construction, commissioning and destination operations.***

Keywords: safety governance; tourism infrastructure; saudi vision 2030; sustainable regional development; occupational safety; mega-project risk; worker welfare; destination resilience

I. INTRODUCTION

Tourism has become one of the most visible pillars of Saudi Arabia's economic diversification agenda. The National Tourism Strategy sets ambitious targets for visitation, gross domestic product contribution and employment, while Vision 2030 programs have accelerated investment in destinations, hospitality assets, airports, roads, cultural districts, entertainment venues and coastal infrastructure (Ministry of Tourism, 2024; Saudi Vision 2030, 2025). These investments are not isolated buildings. They are regional transformation platforms that connect labour markets, supply chains, local communities, ecological assets and international visitor expectations. As a result, tourism infrastructure must be judged not only by completion dates and capital expenditure, but also by the quality of governance that protects workers, residents, visitors and the environments in which new destinations operate.

Safety governance is the set of formal rules, organizational responsibilities, data systems, leadership practices and stakeholder mechanisms that direct how risk is anticipated, controlled, monitored and learned from. In conventional construction management, safety is often treated as a site-level obligation handled by contractors. In Saudi tourism infrastructure, this narrow view is insufficient. Giga-projects and regional destinations involve complex interfaces among excavation, marine works, vertical construction, accommodation, transport, energy, utilities, crowd management and eventual tourism operations. They also operate in hot climatic conditions and in locations where new communities and workforces are being assembled rapidly. This means that safety governance directly influences productivity, continuity, reputation and social sustainability (Al-Otaibi and Kineber, 2023; Mosly and Makki, 2020).

The relevance of safety to regional development is especially clear in emerging tourism zones. A destination that reports repeated injuries, labour

grievances, heat illness, transport incidents or environmental emergencies may face delays, higher insurance costs, loss of stakeholder confidence and negative media attention. Conversely, a destination that demonstrates transparent safety leadership, worker welfare and digital risk control is more likely to sustain investor trust, attract skilled partners and create a durable visitor economy. UN Tourism (2024) frames safety and security as prerequisites for resilient tourism development, while the OECD (2025) argues that destination plans must be forward-looking and aligned with national strategies. These principles are highly applicable to the Saudi context.

This review is guided by the following aim: to examine how safety governance can function as a driver of sustainable regional development in Saudi Arabia's tourism infrastructure projects. Four objectives support the aim: first, to synthesize recent evidence on safety, construction risk and tourism governance; second, to identify mechanisms by which safety governance affects project and destination outcomes; third, to develop a conceptual framework suited to Saudi tourism infrastructure; and fourth, to propose practical policy and managerial indicators. The review contributes by shifting the discussion from safety as accident prevention to safety as a regional development capability.

II. THEORETICAL BACKGROUND AND REVIEW SCOPE

The paper integrates four theoretical lenses. Institutional theory explains why national strategies, regulations and public agencies shape the behaviour of developers, consultants and contractors. Saudi Arabia's National Council for Occupational Safety and Health was established under the National Transformation Program to coordinate compliance, adopt international practice and protect workers, which demonstrates the institutionalization of safety as a development priority (NCOSH, 2025). Stakeholder theory is also central because tourism destinations succeed through coordination among government entities, investors, local communities, contractors, employees, visitors and environmental regulators. Roxas et al. (2020) show that sustainable tourism governance depends on clarifying stakeholder roles and encouraging cooperation rather than leaving destination management to one actor.

A sustainable development lens adds the long-term dimension. Tourism infrastructure can generate jobs, regional income and cultural exchange, yet it can also intensify energy use, land pressure, mobility demand and ecological disturbance if governance is weak. Emam and Ali-Dinar (2024) confirm the growth role of tourism in Saudi Arabia while emphasizing the need to conduct tourism activity sustainably. Rasoolimanesh et al. (2023) further show that tourism indicators should be linked to the Sustainable Development Goals rather than measured only through arrivals and receipts. Safety belongs in this sustainability logic because preventable harm undermines human capital, community trust and operational resilience.

Human capital theory completes the framework. Large tourism projects depend on workers with technical, operational and service capabilities. Unsafe workplaces create absenteeism, turnover, low morale and loss of experienced labour. Construction safety climate studies in Saudi Arabia identify management commitment, supervision, training, communication, risk appraisal and worker involvement as key determinants of safety perception (Mosly and Makki, 2020). Makki and Mosly (2021) add that safety climate can be predicted and managed through measurable organizational variables, making it a practical governance concern rather than an abstract culture issue.

The review focuses on tourism infrastructure projects rather than tourism marketing or visitor behaviour alone. The term includes physical and enabling assets: hotels, resorts, heritage restoration, roads, airports, public realm, utilities, ports, entertainment venues, event facilities, worker villages and digital operating platforms. It also includes the transition from construction to destination operation because risks change during commissioning, crowd flow, maintenance and emergency response. The review therefore connects occupational safety, construction governance, mega-project risk, destination resilience and regional development. The time boundary of 2020-2025 reflects the post-pandemic acceleration of

tourism policy, updated OSH governance and the latest literature on Saudi construction safety and sustainable tourism.

III. METHODOLOGY

A structured narrative review design was adopted because the topic cuts across multiple bodies of evidence and because the objective is framework development rather than statistical meta-analysis. The approach follows transparent review principles used in sustainability and tourism studies while allowing interpretive synthesis across policy reports, peer reviewed articles and project disclosures. The search covered four domains: Saudi tourism and Vision 2030 infrastructure; construction safety and worker welfare; mega-project risk and sustainable construction; and safety, security and resilience in destination governance. Sources were limited to English language documents published from 2020 to 2025, except where a current standard was explained through an updated institutional page.

The inclusion criteria were as follows: the source had to discuss Saudi Arabia, tourism, construction, infrastructure, occupational safety, destination governance, sustainable development, mega-project risk or a directly relevant international framework. Peer reviewed sources were prioritized for theory and empirical evidence, while official sources were used for policy direction and project governance. Exclusion criteria removed articles focused only on marketing, hotel customer satisfaction or unrelated sectors unless their governance implications were transferable. The final evidence base included studies on Saudi safety climate and construction barriers, tourism-growth-environment relationships, regional hard and green infrastructure, OSH strategy, heat exposure, worker welfare, project ESG reporting, and global tourism resilience (Alfehaid, 2025; Al-Otaibi and Kineber, 2023; ILO, 2024a; UN Tourism, 2024).
The analysis used thematic coding. First, each source was coded for risk domain, governance mechanism, regional development outcome and indicator type. Second, codes were grouped into four pathways: regulatory alignment, contractor accountability, digital evidence and worker welfare. Third, the pathways were compared against development outcomes such as project productivity, regional employment, social licence, destination confidence and environmental stewardship. This produced a conceptual framework rather than a causal model. The method is appropriate because safety governance in tourism infrastructure is still an emerging research area and because Saudi projects vary by geography, ownership, ecological sensitivity and delivery stage.

Quality appraisal considered authority, relevance, methodological clarity and recency. Empirical studies were valued when they stated sample, method and findings. Policy documents were valued when they came from official bodies or recognized international organizations. Project reports were used cautiously as governance signals rather than independent proof of performance. For example, Red Sea Global and Qiddiya disclosures show how ESG, regeneration and risk assessment are being framed, while external sources on migrant labour and heat stress highlight areas where project governance must remain transparent and independently accountable (Human Rights Watch, 2024; Qiddiya Investment Company, 2024; Red Sea Global, 2024). This balance reduces the risk of presenting corporate ambition as verified outcome.

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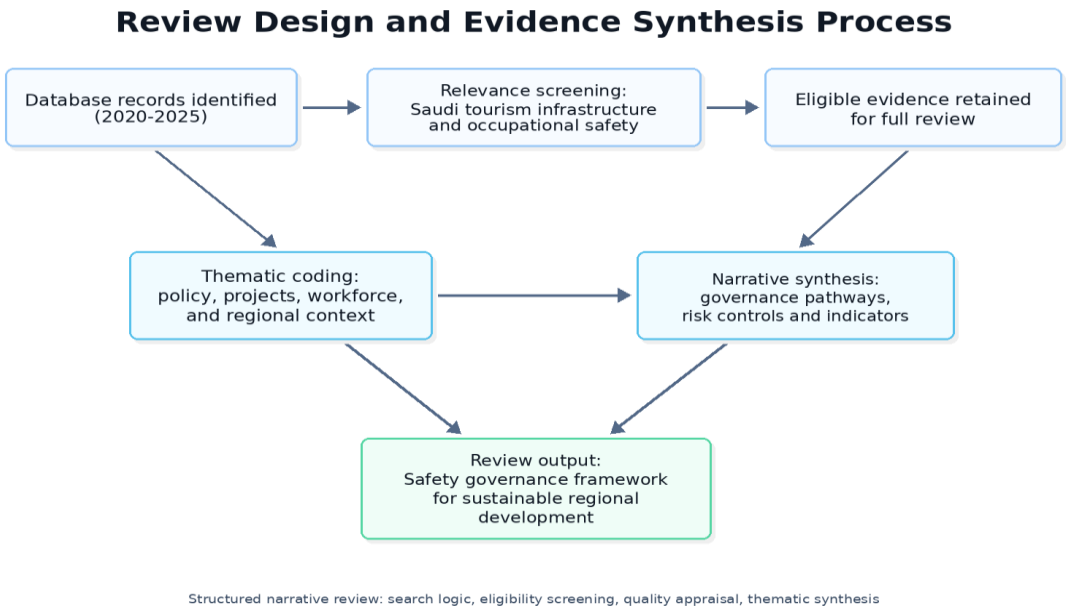

Figure 1. Structured review design and synthesis workflow.

Findings and thematic synthesis

The first finding is that safety governance supports sustainable regional development by reducing delivery disruption. Tourism infrastructure projects carry concentrated schedule risks because hotels, mobility links, utilities, public realm and destination services must often open in coordinated phases. A serious incident can suspend work, trigger investigation, cause labour shortage, damage contractor relationships and delay linked assets. Studies of Saudi construction safety show that barriers to health and safety programs include weak safety culture, inadequate training, insufficient enforcement and poor communication between project parties (Al-Otaibi and Kineber, 2023). In a tourism destination, these barriers are development risks because a delayed hotel, unsafe road link or unfinished utility network can reduce regional visitor capacity.

The second finding is that safety governance improves the credibility of tourism regions. The Red Sea, Qiddiya, Diriyah, AlUla and other destinations are positioned for international visitors and investors. This positioning depends on more than architecture. It depends on evidence that projects meet credible standards for worker protection, emergency preparedness, environmental safeguarding and inclusive growth. UN Tourism (2024) emphasizes that safety and security policies strengthen tourism resilience and local economic development. Likewise, the National Red Sea Sustainability Strategy links economic development, social development, safety and governance through maritime security, emergency resilience and coordinated coastal stewardship (National Red Sea Sustainability Strategy, 2025).

The third finding is that contractor accountability must extend through the supply chain. Tourism infrastructure typically relies on layered subcontracting, temporary labour, specialist packages and joint ventures. Safety governance fails when responsibility is transferred downward without authority, resources or reporting visibility. International mega-project guidance warns that complex projects need clear authority, scrutiny, benefit ownership and adaptive governance (National Audit Office, 2025). In Saudi construction, safety climate evidence similarly points to management commitment, supervision, worker involvement and competence as practical levers (Makki and Mosly, 2021; Mosly and Makki, 2020). Therefore, safety obligations should be embedded in procurement,

prequalification, contract incentives, audits and payment systems.

Table 1. Thematic synthesis of safety governance domains in Saudi tourism infrastructure.

Governance domain	Tourism infrastructure risk	Regional development implication	Indicative evidence
Regulatory alignment	Fragmented requirements across construction, tourism, environment and civil defence	Improves legal certainty, investor confidence and readiness for destination operations	Saudi OSH institutions; ISO 45001; UN Tourism safety policy
Contractor accountability	Layered subcontracting, inconsistent training and weak reporting	Reduces stoppages, claims, accidents and reputation loss	Saudi safety climate and program barrier studies
Digital evidence systems	Late discovery of hazards and weak corrective action tracking	Enables predictive control and cross-project learning	BIM, dashboards, permit systems, leading indicators
Worker welfare	Heat stress, accommodation, transport, recruitment and grievance risks	Protects human capital and strengthens social licence	ILO heat guidance, IOSH/NIOSH collaboration, welfare reports
Place-based controls	Different coastal, desert, urban and heritage risk profiles	Aligns safety with local ecology, community needs and destination identity	Red Sea strategy, Alfehaid regional tourism infrastructure study

The fourth finding is that heat exposure is a material governance issue for Saudi tourism infrastructure. Many destination assets are built outdoors and in remote coastal, desert or mountainous contexts. The ILO (2024b) stresses that heat exposure should be managed through science-based controls, local practices and combined action, while Idris et al. (2025) propose gap analysis as a way to compare current heat controls with recommended interventions. For tourism projects, heat governance includes work-rest cycles, shaded logistics, hydration systems, medical surveillance, wearable alerts where appropriate, supervisor training, multilingual communication and emergency escalation. Heat controls should be integrated into schedule planning, not treated as a summer add-on.

The fifth finding is that digital evidence systems can turn safety from reactive reporting into preventive governance. This includes incident dashboards, permit-to-work platforms, IoT environmental monitoring, camera analytics, BIM-linked risk registers, competency records and transparent reporting across owners and contractors. Digital systems do not replace leadership, but they make hidden risk visible and allow trends to be compared across packages, regions and contractors. Tourism infrastructure benefits from this because the same data architecture can support future destination operations: crowd safety, asset maintenance, emergency preparedness, mobility management and visitor experience.

The sixth finding is that safety governance must be place-based. Saudi regions differ in climate, workforce availability, heritage sensitivity, biodiversity, transport access and community expectations. Alfehaid (2025) shows that regional tourism performance in Saudi Arabia is shaped by the interaction between hard infrastructure and green infrastructure, with different needs across regions. This supports a localized safety approach. A coastal resort requires marine emergency planning and ecological protection. A heritage district requires structural stability, conservation safety and crowd flow planning. A mountain or desert destination requires heat, transport and remote emergency

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response controls. A one-size national checklist is necessary but not sufficient.

The seventh finding is that worker welfare is inseparable from destination sustainability. Large tourism projects often rely on migrant and mobile workers who may face recruitment, accommodation, transport and grievance risks. Human Rights Watch (2024) raised concerns about worker abuse in some Saudi giga-project contexts, while IOSH (2025) reported cooperation with Saudi NIOSH to strengthen workplace health and safety training and prevention culture. The governance lesson is not that tourism projects are inherently unsafe; it is that credible regional development requires transparent worker welfare systems, grievance mechanisms, medical access, fair recruitment monitoring and independent assurance.

Finally, safety governance links the construction phase to the operating phase. A destination may be physically complete but operationally fragile if emergency response, maintenance access, utilities, evacuation routes, crowd management, security coordination and staff training are not embedded early. OECD (2025) argues that strong destinations need strategic plans aligned with national policy and future shocks. For Saudi tourism infrastructure, the future shock may be extreme weather, crowd pressure, supply interruption, marine incident, heatwave, fire, transport disruption or reputational crisis. Safety governance is therefore part of destination resilience, not merely a construction compliance file.

Figure 2. Safety governance and regional development nexus for tourism infrastructure.

IV. PROPOSED SAFETY-GOVERNANCE FRAMEWORK

The proposed framework is called the Safety Governance for Regional Tourism Development Framework. It contains four governance pathways and five development outcomes. The first pathway, regulatory alignment, requires that project policies comply with Saudi labour law, OSH requirements, civil defence, environmental regulations, tourism licensing, heritage rules and international management standards where applicable. ISO 45001 is useful because it frames occupational health and safety as a management system based on leadership, risk control and continual improvement (HSE, 2021). Regulatory alignment also requires coordination among ministries, regional authorities and project sponsors so that rules are not fragmented across construction, tourism and environment.

The second pathway is contractor accountability. Owners should require safety capability at tender stage, not after mobilization. Evaluation should include incident history, safety leadership resources, heat management plans, worker welfare systems, subcontractor controls, training records and digital reporting maturity. Contracts should contain leading indicators, stop-work authority, transparent audit rights, incentives for prevention and penalties for concealment. Coskun et al. (2023) show that sustainable mega-project risk management should integrate social, environmental and economic objectives; contractor accountability is the mechanism through which those objectives are translated into daily delivery decisions.

The third pathway is digital evidence and learning. Safety performance should be measured by leading and lagging indicators: hazard closure time, critical control verification, competency compliance, heat stress alerts, near-miss reporting quality, corrective action completion, emergency drill performance and serious incident rates. Data should be visible to project leadership and integrated with design, schedule and procurement decisions. However, digital monitoring must be governed ethically. Wearables, cameras and analytics should protect workers, not become tools of excessive surveillance. Clear data rules, worker communication and privacy safeguards are needed to maintain trust.

The fourth pathway is place-based welfare and community integration. Tourism destinations succeed when workers, residents and visitors see the project as beneficial and trustworthy. Welfare therefore includes safe accommodation, transport, food, healthcare, recreation, grievance channels, fair recruitment and communication in workers' languages. Community integration includes local training, small business opportunities, emergency coordination and respect for cultural and ecological assets. Qiddiya's ESG reporting describes sustainability topics, priority initiatives and peer benchmarking, while Red Sea Global emphasizes regenerative tourism, community empowerment and environmental protection (Qiddiya Investment Company, 2024; Red Sea Global, 2024). These examples show the direction of governance, but performance must be continuously verified.

The framework produces five development outcomes. First, it protects human capital by reducing injury, illness and turnover. Second, it improves project continuity through fewer stoppages and disputes. Third, it strengthens investor and visitor confidence because safety evidence reduces reputational risk. Fourth, it supports inclusive regional employment by making tourism work more attractive and professional. Fifth, it improves environmental and emergency resilience by linking safety planning to ecosystems, mobility and destination operations. The framework therefore positions safety governance as a driver of value creation, not a cost center.

V. DISCUSSION

The review demonstrates that safety governance occupies a strategic position between construction delivery and sustainable tourism development. In Saudi Arabia, tourism infrastructure is being built at a scale that few destinations have attempted simultaneously. Such scale creates opportunities for regional diversification, but it also increases exposure to interface failures. If safety is left to individual contractors, risks remain fragmented. If safety is governed at program level, risks can be compared, escalated and learned from across regions and project packages.

The discussion also highlights a tension between speed and assurance. Vision 2030 has accelerated delivery, and tourism projects often face public milestones linked to events, seasons or investor announcements. However, mega-project research repeatedly warns that pressure to begin before deliverability is fully understood can weaken governance and increase future cost or delay (National Audit Office, 2025). Safety governance can moderate this tension by requiring readiness gates: design-for-safety review before construction, welfare readiness before mass mobilization, heat controls before summer peaks, emergency preparedness before soft opening and asset maintenance readiness before handover.

A second tension is between image and evidence. Tourism destinations depend heavily on reputation. Corporate sustainability reports, awards and destination branding can communicate ambition, yet stakeholders increasingly expect verifiable performance. Human Rights Watch (2024) and heat-stress research show that labour and welfare risks can undermine trust when workers' experiences conflict with promotional narratives. Therefore, Saudi tourism projects should move toward independently assured safety and welfare reporting, not only high-level ESG storytelling. This is consistent with the ILO's recognition of safe and healthy work as a fundamental right and its 2024-2030 strategy for stronger OSH systems (ILO, 2024a).

A third tension is between national standardization and regional specificity. National OSH coordination is essential, but regions such as Tabuk, Riyadh, Makkah, Madinah, Asir and the Red Sea coast have different risk profiles. Alfehaid (2025) shows that tourism infrastructure effects vary across Saudi regions, suggesting that development policy should be sequenced according to local capacity. The same is true for safety governance. Mature urban destinations may need crowd and traffic safety, while emerging regions may need worker accommodation, emergency medical capacity and contractor development. Coastal destinations require marine, diving, boating and ecological emergency planning. Heritage destinations require conservation risk, crowd flow and structural safety.

The framework also complements international sustainable tourism debates. Saarinen (2021) distinguishes responsible tourism from sustainability by emphasizing long-term systemic outcomes, while Rasoolimanesh et al. (2023) show that tourism indicators must be connected to SDG outcomes. Safety governance operationalizes this connection. It converts sustainability values into measurable controls: injury reduction, workforce competence, emergency readiness, environmental incident prevention, local employment quality and transparent grievance handling. In doing so, it helps tourism regions move from project completion toward durable destination stewardship.

The most important managerial implication is that safety should be designed into the front end of tourism infrastructure. Feasibility studies should include safety capacity, emergency access, worker housing, climate exposure and regulatory interface assessment. Design teams should apply prevention-through-design principles, including safe maintenance access, evacuation routes, service corridors, traffic separation, shaded public realm and fire safety. Procurement teams should select contractors for capability, not only price. Operations teams should inherit a live safety case, not a static handover folder. This lifecycle logic makes safety governance part of regional competitiveness.

For policymakers, the implication is that safety data should be included in tourism development dashboards. Visitor numbers, hotel keys and investment values do not fully represent sustainable development. Indicators such as serious injury frequency, heat illness rate, worker welfare audit closure, local workforce training hours, emergency drill performance, contractor compliance scores, road access safety and environmental incident response time would provide a more balanced picture. These metrics would also support learning across regions, helping Saudi Arabia build a national tourism safety knowledge base.

A further implication is that safety governance should be designed as a learning architecture rather than a static compliance manual. Tourism infrastructure programs usually evolve through master planning, early works, enabling utilities, vertical construction, testing, commissioning and opening. Each phase produces different hazards and different information. During excavation and heavy lifting, leadership may focus on plant segregation, work permits and lifting plans. During fit out, the dominant issues may shift to electrical isolation, confined spaces, working at height, fire loading and simultaneous trades. During commissioning and soft opening, risk may move toward public interface, emergency drills, staff competence and handover documentation. A governance system that treats these changes as a planned transition can prevent gaps between contractors, facility managers and destination operators.

Regional authorities also need safety data that is useful for development decisions. Lagging indicators such as lost time injuries are necessary, but they are insufficient because they show harm after it occurs. Tourism programs should give equal attention to leading indicators, including overdue corrective actions, repeated high-potential near misses, critical control verification, welfare audit closure, heat index exceedance, emergency exercise performance and subcontractor training coverage. These measures allow leaders to detect weak signals before they become public crises. They also make it possible to compare regions and contractors fairly, provided the metrics are standardized and independently assured. Transparent indicators can strengthen confidence among lenders, insurers, community representatives and international operators.

The review also suggests that safety governance should be connected with environmental and social governance, not reported as a separate technical file. On coastal and heritage projects, an incident can harm people and sensitive ecosystems at the same time. Fuel storage, marine transport, temporary camps, waste handling, dust control, night work and emergency access all show how occupational, environmental and community risks overlap. Integrated governance can reduce duplication because one inspection may verify housekeeping, fire safety, welfare, drainage, spill prevention and access at the same location. This integrated approach is important for Saudi tourism regions seeking to market themselves as premium, regenerative and culturally respectful destinations.

A final implication concerns capability building. Sustainable regional development requires local supervisors, engineers, emergency responders, inspectors, small contractors and tourism workers who understand safety as part of professional service quality. Training should therefore move beyond induction videos and generic toolbox talks. It should include scenario-based exercises, bilingual coaching, supervisor mentoring, heat-stress decision rules, contractor leadership workshops and lessons learned from other Saudi destinations. Universities and technical institutes can support this agenda by linking tourism, construction management, occupational safety, environmental planning and digital analytics. In this way, safety governance becomes a mechanism for human capital development.

This capability perspective is particularly important because tourism destinations continue operating long after construction teams demobilize. If safety knowledge disappears at handover, the region inherits hidden liabilities. Owners should therefore require a destination safety case that records design assumptions, residual risks, maintenance constraints, emergency resources, crowd management assumptions, environmental sensitivities and worker welfare commitments. The safety case should be updated during operations as visitor patterns, climate exposure and asset conditions change. Such continuity helps Saudi regions convert temporary construction investment into durable destination resilience.

The strategic value of this approach is that it supports both accountability and innovation. Accountability is achieved when boards, regulators and contractors can show who owns each critical control and how performance has been verified. Innovation is achieved when the same evidence encourages better design choices, safer modular construction, more reliable logistics, healthier accommodation, smarter heat controls and better emergency planning. These improvements may not always appear in traditional cost-benefit calculations, yet they reduce uncertainty and make regional growth more bankable. For tourism infrastructure, bankability is not only financial; it also includes social acceptance, environmental credibility and operational readiness.

For managers, the central lesson is to treat safety meetings, audits and dashboards as development tools. They should not become ritual paperwork. A useful governance meeting asks whether risks are being transferred, whether corrective actions are closing, whether workers understand controls, whether welfare systems are trusted and whether construction decisions will create operational hazards. This disciplined questioning turns safety into a daily method for protecting regional value. It also gives communities a clearer basis for judging whether growth is respectful, whether jobs are safe,

whether disruption is being managed and whether destination promises are matched by visible responsibility on the ground, where regional development is experienced by people rather than reported in plans.

VI. CONCLUSION, RECOMMENDATIONS AND FUTURE RESEARCH

This review concludes that safety governance is a central driver of sustainable regional development in Saudi Arabia's tourism infrastructure projects. The evidence shows that safety affects more than accident rates. It shapes project continuity, workforce capability, investor confidence, community trust, visitor assurance and environmental resilience. As Saudi Arabia scales tourism destinations under Vision 2030, safety governance should be treated as an enabling infrastructure alongside roads, hotels, utilities and digital networks.

Five recommendations follow. First, project sponsors should create integrated safety governance boards that include owner representatives, contractors, worker welfare specialists, environmental managers, emergency services and regional authorities. Second, safety capability should be embedded in procurement through prequalification, contract incentives and supply-chain audit rights. Third, all major tourism infrastructure projects should adopt heat stress management plans based on science-based exposure controls and real-time supervision. Fourth, destination developers should publish independently assured safety and worker welfare indicators to strengthen transparency. Fifth, safety planning should continue into operations through crowd management, maintenance safety, emergency drills, transport controls and visitor-facing risk communication.

Table 2. Proposed policy and management indicators for safety-led regional tourism development.

Policy/management action	Lead actors	Suggested indicators	Expected development value
Create a regional safety governance board for each destination	Project sponsor, regional authority, contractors, emergency services	Meeting closure rate; cross-agency actions; unresolved critical risks	Clear accountability and faster escalation
Embed safety in procurement and payment	Owners, procurement teams, contractors	Prequalification scores; audit findings; subcontractor compliance	Improved delivery reliability and reduced dispute risk
Implement science-based heat stress controls	HSE teams, supervisors, medical providers	Heat illness cases; hydration compliance; work-rest conformance	Protection of workforce productivity and well-being
Publish assured worker welfare and safety metrics	Developers, assurance bodies, regulators	Serious injury frequency; grievance closure; accommodation audit score	Greater trust among investors, workers and communities
Link construction safety case to destination operations	Designers, operators, civil defence, tourism authority	Emergency drill results; maintenance access risks; crowd safety drills	Resilient visitor economy and safer public realm

The review has limitations. It synthesizes recent literature and policy evidence but does not test causal relationships using project-level incident data. Some project disclosures are self-reported and may not capture worker experience or contractor-level variation. Future research should develop comparative case studies of Saudi tourism regions, examine the relationship between safety indicators and project productivity, and test digital safety governance models in extreme heat contexts. More work is also needed on safety during the transition from construction to destination operation, especially for coastal, heritage and adventure tourism assets. Despite these limits, the paper offers a practical conceptual contribution: sustainable tourism infrastructure is not achieved when assets are built,

but when safety governance makes regional growth resilient, inclusive and credible.

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