Position Paper: Strengthening National Infrastructure Planning for Disaster Mitigation in Jamaica

Emanating from the Panel Discussion "The Role of National Infrastructure Planning in Disaster Mitigation"

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Executive Summary

This position paper summarizes the key conclusions and consensus recommendations from the symposium panel on national infrastructure planning for disaster mitigation. It translates the panel's themes, strategic planning, policy alignment, risk management, engineering standards, hazard-data integration, governance, financing, and accountability, as well as near-term action commitments, into a clear reform agenda for Jamaica's infrastructure system.

Central to the recommendations is a shift from reactive disaster response to proactive, risk-informed infrastructure planning, with enforceable standards, transparent accountability, and financing mechanisms that prioritize lifecycle resilience. The paper proposes an implementation roadmap with immediate (0–12 months), medium-term (1–3 years), and long-term (3–5 years) actions, and identifies institutional roles for the government, regulators, local authorities, utilities, the private sector, academia, and professional bodies.

Context and Rationale

Recent events have highlighted that resilience cannot rely solely on emergency response. It must be intentionally integrated into how Jamaica plans, designs, regulates, finances, and maintains its national infrastructure systems, including roads, bridges, drainage networks, utilities, and public facilities.

Disaster impacts reveal systemic weaknesses: development in hazard-prone areas, under-designed drainage systems, deferred maintenance, inconsistent enforcement of approvals, and fragmented responsibilities among agencies. A national planning approach that treats resilience as a core requirement, rather than an optional feature, is essential for safeguarding lives, livelihoods, and the country's productivity.

Key Messages Emerging from the Panel

The panel's framing highlighted five key themes that must be addressed together to build true resilience: (i) governance and coordination; (ii) enforcement and accountability; (iii) incorporating hazard and climate data into planning and design; (iv) financing models that prioritize lifecycle performance; and (v) institutional capacity and professional responsibility. These themes are interconnected—no single action will succeed without the others.

Priority Recommendations

The panel's recommendations are organized into four pillars: (1) Strategic Planning and Policy Alignment; (2) Risk, Engineering Standards, and Data Integration; (3)

Governance, Financing, and Accountability; and (4) Implementation, Monitoring, and Continuous Improvement. ***1. Strategic Planning and Policy Alignment*** *(1) Mandate risk-informed planning gates forpublic capital projects:* All public infrastructure projects should be required to complete a standardized 'Resilience Screening' at the concept stage (before design funding is released). This screening should confirm hazard exposure, criticality, service continuity requirements, and the minimum design/mitigation approach.

(2) Align land-use planning with hazard exposure and infrastructure capacity: Development approvals should be demonstrably consistent with floodplain management, coastal setbacks, slope stability constraints, and drainage/utility capacity. Where approvals exceed capacity, phased development triggers and developer contributions should be required.

(3) Publish and maintain sectoral resilience master plans: Transport, water, drainage, energy, and communications should each have risk-informed master plans that define priority corridors/assets, minimum service levels during disasters, and planned redundancy.

(4) Institutionalize lifecycle thinking: Public investment decisions should include lifecycle costing and 'failure consequence costs' (such as economic disruption, emergency response burden, repair escalation, and public safety impacts) rather than relying mainly on the lowest upfront cost.

2. Risk, Engineering Standards, and Hazard-Data Integration

(1) Make hazard maps a mandatory approval step: Flood, landslide, and coastal hazard maps should be integrated into planning approval processes, ensuring that high-risk areas automatically activate requirements for mitigation design or relocation decisions.

(2) Update design standards based on climate-informed assumptions: Drainage design storms, wind loading assumptions, coastal wave/run-up parameters, and slope stability thresholds should incorporate updated climate projections and observed extremes. A regular review cycle (e.g., every 3–5 years) should be established.

(3) Require resilience-focused design documentation: Projects should include a clear 'Resilience Design Statement' describing hazards, assumptions, redundancy, maintainability, and expected performance under stress. This enhances transparency and allows for independent review.

(4)Expandconformityassessmentandconstruction Quality Assurance/Quality Control (QA/QC): Material testing, site supervision certification, and independent verification should be improved, with audit trails that can be reviewed afterward.

3. Governance, Financing, and Accountability

(1) Create a nationwide coordination system forinfrastructure resilience: Jamaica needs a cross-ministry resilience coordination body or technical secretariat responsible for establishing minimum standards, resolving institutional overlaps, and publishing annual performance reports.

(2) Develop a Critical Infrastructure Risk Register and prioritization program: A national register should identify key assets (such as bridges, hospitals, shelters, water pumping stations, major drains, and critical road links) and rank interventions based on their effectiveness in risk reduction and maintaining continuity.

(3) Adopt a blended resilience financing approach: Recommended channels include: (i) dedicated annual budget lines for critical maintenance; (ii) climate adaptation and resilience grants; (iii) performance-based PPPs with enforceable resilience outputs; (iv) insurance-linked incentives; and (v) catastrophe-resilient financing instruments where feasible.

(4) Introduce procurement rules that reward resilience, not just the lowest price: Tender evaluation should incorporate resilience performance criteria, lifecycle costs, maintainability, and contractor quality systems. Payments should be tied to verified compliance milestones.

(5) Strengthen professional accountability: Engineering sign-off responsibilities should be clarified for critical work, supported by ongoing professional development in resilience, and reinforced through ethics and practice standards. The JIE can support national capacity by providing guidance, offering CPD, and delivering independent technical advice upon request.

4. Implementation, Monitoring, and Continuous Improvement

(1) Develop resilience KPIs and annual scorecards: Key performance indicators should include restoration time targets for critical corridors, the proportion of projects passing resilience screening, inspection coverage rates, drainage clearing performance, and audit findings on compliance.

(2) Institutionalize post-event learning: After-action reviews should be mandatory for critical failures (e.g., bridge closures, drain collapses, major road washouts) with corrective actions tracked and published.

(3) Strengthen local authority capacity: Parish-level planning and enforcement require training, tools (GIS/hazard layers), and inspection resources to apply standards consistently across Jamaica.

12-Month Action Agenda

Within the next 12 months, the panel's discussion suggests a feasible set of priorities:

- Launch a standardized Resilience Screening template and mandate its use for all new public capital projects.
- Establish an interim Critical Infrastructure Risk Register and publish a prioritized Top-10 intervention list.
- Issue a directive requiring hazard-map checks for approvals (floodplains, coastal setbacks, slope risks).
- Begin an accelerated review of drainage and wind-related design assumptions and publish interim design advisories.
- Pilot resilience-based procurement scoring on at least two major infrastructure projects.
- Formalize post-event after-action review processes and publish an annual 'State of Infrastructure Resilience' scorecard.

Roles and Responsibilities

Government and Ministries: Establish policy direction, mandate resilience screening, secure funding, and coordinate cross-agency efforts.

Regulators and Statutory Agencies: Incorporate hazard data into approval processes, enforce codes and standards, and enhance inspection and audit systems.

Local authorities: Enforce land-use regulations, maintain drainage and road infrastructure, and apply hazard-informed approval processes.

Utilities and network operators: Collaborate with national plans to ensure lifeline resilience, redundancy, and effective restoration protocols.

Private Sector and Contractors: Meet performance requirements, uphold quality systems, and follow conformity assessment.

Academia (UTech/UWI/CMU): Support research, data analysis, pilot innovations, and workforce upskilling for resilience engineering.

Professional Bodies (JIE): Offer technical leadership, ongoing professional development, standards advocacy, public education, and the ability to bring together different sectors to maintain collaboration.

Specific Roles of Key Jamaican Agencies (Recommended for a National Resilience Plan)

NEPA (National Environment and Planning Agency): Acts as the leading technical authority for integrating environmental safeguards and hazard-risk information into development approvals; requires EIAs/ESIAs to explicitly address flood, coastal erosion, landslides, and climate risks; enforces setback buffers and ecosystem-based mitigation (such as wetlands and mangroves) to reduce disaster impacts.

NWA (National Works Agency): Lead resilience improvements of the national road network and bridges; maintain a national inventory of critical corridors and failure points; incorporate climate-informed design storms, slope stabilization, and bridge-scour protection into standards; coordinate pre-storm drain and culvert clearing with local authorities and publish restoration time targets for critical routes.

ODPEM (Office of Disaster Preparedness and Emergency Management): Establish national continuity requirements and emergency performance targets for critical infrastructure; organize multi-agency contingency planning and exercises; coordinate post-event after-action reviews for major infrastructure failures and track corrective actions across agencies.

PIOJ (Planning Institute of Jamaica): Align resilience priorities with national development planning and public investment programs; support benefit–cost and lifecycle-risk evaluations for resilience projects; coordinate monitoring frameworks and annual reports on national resilience indicators.

Local Government Authorities / Municipal Corporations: Enforce land-use regulations and development conditions at the parish level; maintain local drainage and community road assets; utilize hazard layers in building and development approvals; enhance routine inspections, illegal development enforcement, and maintenance scheduling.

NWC (National Water Commission): Enhance resilience of water production, pumping, and distribution infrastructure; safeguard source watersheds; establish redundancy and emergency power for critical stations; collaborate with ODPEM and telecom providers for public alerts and supply continuity during outages.

JPS and Energy Sector Operators: Reinforce substations, feeders, and generation support systems; expand targeted undergrounding and vegetation management in high-risk corridors; implement microgrid and backup solutions for shelters, hospitals, and pumping stations; coordinate restoration priorities with national emergency plans.

Telecommunications Providers & Spectrum Management Authority: Ensure resilient emergency communications by implementing redundant routing, fortified towers, backup

power sources, and rapid restoration protocols; prioritize public warning systems; support spectrum readiness for emergency channels; and deployable communication assets.

***OUR (Office of Utilities Regulation) / Relevant Regulators*:** Incorporate resilience obligations into service standards and license conditions where suitable; mandate reporting on reliability, restoration times, and resilience investments; and support consumer-protection measures along with transparent resilience performance scorecards.

NHT (National Housing Trust): Support resilient housing delivery and community-protective infrastructure in vulnerable areas, such as drainage, access roads, and retaining walls, through a dedicated resilience financing program tied to verified climate-smart building standards and compliance audits.

NSWMA, WRA, and other sector agencies (as applicable): Incorporate solid-waste continuity (debris management), water-resources allocation, watershed protection, and environmental services into resilience planning to minimize secondary hazards and speed up recovery.

These agencies should operate within a unified national resilience coordination system that shares hazard data, uses standard resilience screening templates, clearly defines restoration priorities, and produces annual public reports. This approach reduces institutional overlap and ensures resilience is consistently applied from planning and approval through construction, maintenance, and post-event analysis.

Conclusion

Infrastructure resilience is not just a technical feature; it is a national planning philosophy that demands strong governance, enforced standards, risk-informed investment, professional accountability, and coordinated institutional leadership. Jamaica can significantly reduce disaster impacts by adopting practical reforms that make resilience the default requirement in planning, design, construction, and maintenance, supported by transparent monitoring and ongoing funding.