

Higher Education Financing: Challenges for Small Independent States in the Caribbean

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Abstract

This paper examines the critical and persistent challenges confronting the financing of higher education (HE) systems within the Small Independent States (SIS) of the Caribbean. The Caribbean states face a unique nexus of structural, fiscal, and environmental vulnerabilities that compromise the long-term sustainability and equitable access of tertiary institutions, notably the University of Trinidad and Tobago (UTT), the University of the West Indies (UWI), and other national Caribbean colleges. The overarching challenges lie in the trilemma of small states: high operating costs due to limited economies of scale, inelastic public revenues, and disproportionate exposure to exogenous shocks, particularly escalating climate change-induced disasters. This financial volatility leads to HE systems being severely underfunded, characterized by reliance on diminishing government subventions, increasing tuition burdens on low-income populations, and underdeveloped private-sector investment. Furthermore, the limited administrative capacity of many SISs impedes their ability to navigate complex multilateral funding mechanisms and diversify revenue streams, thereby compounding their debt vulnerability. This paper argues that current financing models, often based solely on per capita Gross National Income (GNI), fail to account for the acute, multidimensional vulnerability of Caribbean SIS. Sustainable HE financing requires a change in basic assumptions, advocating for industry regional collaboration on shared resources and the adoption of vulnerability-adjusted metrics, such as the proposed Multidimensional Vulnerability Index (MVI), to unlock predictable, concessional development finance dedicated to building resilient educational infrastructure and fostering future human capital.

Keywords: higher education financing, higher education leadership, higher education policy, higher education in the Caribbean, financing higher education in the Caribbean, higher education and climate shocks

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Introduction

The Role of Higher Education in Small Island Developing States (SIDS)

The higher education (HE) sector in the Caribbean Small Independent States (SIS) is crucial, serving as the primary engine for social mobility, economic diversification, and the development of the high-level human capital required for global competitiveness. (Sain & Bozkurt, 2023). For small, resource-constrained nations such as Jamaica, Barbados, Trinidad and Tobago, St. Lucia, and indeed the entire Eastern Caribbean, universities face a complex dual mandate: advancing national development priorities while simultaneously cultivating world-class research and resilient thought leadership (Beckles & Richards-Kennedy, 2021). The regional University of the West Indies (UWI) system, comprising multiple campuses and nations, and major national institutions such as the University of Trinidad and Tobago (UTT), fundamentally underpins this structure. However, this critical function is increasingly threatened by deep-seated structural vulnerabilities inherent to the SIS model, placing severe strain on the financial sustainability and accessibility of higher education from Jamaica in the north to the eastern Caribbean archipelago.

The financial health of regional HEIs is critically dependent on inelastic government subventions, a model that has become untenable under recent global and regional economic shocks. (Finch, 2003). Fiscal pressures, heightened by the COVID-19 pandemic and declining revenues in commodity-dependent states, have led to significant government arrears in contributions to regional institutions (Hutton, 2022). This financial instability is compounded by the high operating costs associated with small scale and geographic dispersion, preventing HEIs from achieving typical economies of scale. Consequently, institutions face difficult choices: either raise tuition fees, which restrict access for low-income populations and undermine equity, or curtail essential investment in modernization, research infrastructure, and climate-resilient facilities needed to secure the region's future.

This paper addresses the central challenge of establishing sustainable financing models for higher education in the Caribbean SIS. The research design for this conceptual paper consisted of historical and comparative data that were utilized in the formulation of the policy initiatives that were obtained. The areas that were investigated were based on challenges of cost sharing, tuition fees, the country's economy, types of university, and access to higher education institutions in the Caribbean. The instruments that were used in this research were policy and document analysis, and as secondary data. The core problem lies in the collision between the Caribbean's disproportionate economic and climate vulnerabilities and the restrictive mechanisms of global finance. Small island states are forced to divert scarce resources toward immediate existential threats, particularly climate adaptation following devastating events such as Hurricane Beryl (exceeding \$3.4 billion USD) in 2024 and Hurricane Melisa (exceeding \$10.5 billion USD) in 2025 (see Table A).

Notwithstanding the current international financial metrics, such as Gross National Income (GNI) per capita, Caribbean countries often fail to access the concessional funding necessary to buffer these shocks (Gamper et al., 2025). Addressing the resilience gap is not optional, as resilient education is the foundation of a competitive region (Cooke & Milano, 2025). The core challenge lies in the trilemma of small states: high operating costs due to limited economies of scale, inelastic public revenues, and disproportionate exposure to exogenous shocks, particularly escalating climate change-induced disasters. The subsequent analysis will examine

this structural trilemma and propose viable policy alternatives for diversifying revenue and reforming international support.

Defining the Caribbean Small Independent States (SIS)

Defining the Caribbean Small Independent States (SIC) is essential to framing discussions of public-sector financing, particularly in higher education. The key characteristics of SIS include the following: structural vulnerabilities, a small land area, limited human capital, undiversified economies with singular product or service dependence (such as trade and/or tourism), and susceptibility to external environmental and economic shocks (Nurse & Pace, 2021). Unlike larger nations, SICs have a limited capacity to absorb significant public debt or implement complex fiscal policies without an immediate and profound domestic impact (Gosine, 2019). This inherent structural fragility means that governmental resource allocation, including recurrent expenditure on higher education, is restricted by the need for resilience and stabilization. This restriction negatively impacts the budgetary allocation placed on public Higher Education Institutions (HEIs).

Statement of the Problem: Compromised Sustainability and Access in HE Financing

The challenge confronting public higher education (HE) financing in the Caribbean small island countries is a critical paradox: the absolute necessity of high-quality tertiary education for long-term economic diversification and human resource development directly clashes with fiscal unsustainability. The perpetual constraint of national budgeting (Pachamama, 2020) is triggered by a limited tax base compounded by a high public sector expenditure. In the circumstances, operating costs rise—often heightened by the diseconomies of small scale and the need to import specialized expertise. The net effect is that the government's fiscal capacity is constrained. A structural funding gap emerges, fundamentally compromising the financial sustainability of the entire system (Bourne, 2011).

The consequential issues arising from a compromised financial sustainability lead directly to a dual crisis affecting both access and quality. When public investment stagnates or declines, HEIs are forced to implement austerity measures, which commonly involve increasing tuition and mandatory student fees. This austerity measure increases the financial burden on students and creates a contradiction to the principle of equitable access. (Teelucksingh, 2022). Concomitantly, some HEIs that attempt to absorb cost increases without significant fee hikes are often compelled to reduce essential operational expenses. The implications result in larger class sizes, decreased investment in research and infrastructure, and reliance on underpaid or part-time faculty. This perpetual cycle of underfunding inevitably reduces academic quality (Kane & Orszag, 2003). Moreover, the relevance of the HE offerings ultimately undermines the region's long-term human capital goals. This research, therefore, addresses this critical information deficit by analyzing and comparing the known financial expenditure patterns to provide the evidence required for sustainable, access-preserving HE financing strategies.

Challenge 1: The Structural Predicament of Small State Financing

High Operating Costs and the Absence of Economies of Scale

Caribbean Small Island States (SIS) are noted for their small size and geographic isolation. This combination of size and isolation inevitably lead *diseconomies of scale* across all public sectors, including higher education (HE). This economic reality means that the unit cost of

providing goods and services, such as a university degree or specialized research, is disproportionately higher than in larger economies (Tauxe, 2024). This high operational expense range from basic logistics of higher import and export costs for specialized laboratory equipment and textbooks to basic campus consumables (United Nations, n.d.).

This structural disadvantage is larger within the higher education ecosystem, where certain fixed costs are unavoidable regardless of student enrollment numbers. A regional institution, such as a faculty of medical sciences or engineering, requires the same complement of high-cost infrastructure—specialized laboratories, comprehensive libraries, and administrative systems—whether it serves 500 or 5,000 students. This significantly increases the per-student cost, creating a persistent efficiency gap. Furthermore, institutions in SIDS face among the highest electricity costs globally due to the rising cost of imported fossil fuels, thereby increasing the operational budget for campus lighting, cooling, and technological resources (United Nations, n.d.).

Ultimately, the inability to realize classical economies of scale acts as a fundamental barrier to the sustainable development of the education sector (Tauxe, 2024). High transportation costs and the necessity of importing specialized human capital (e.g., specific faculty expertise) further embed a high-cost environment. This scenario forces universities to either charge prohibitively high tuition fees, rely on smaller, less diverse income streams, or perpetually struggle to cover fixed operating expenditures, placing immense pressure on already strained government subsidies.

Inelastic Public Revenues and Competing Fiscal Demands

Caribbean SIS possess narrow and highly undiversified economic bases. This inelastic public revenue stream render these economies vulnerable to external fluctuations. For many states, the economic structure is fundamentally reliant on a single dominant sector, primarily tourism, which contributes an average of 30% to the Gross Domestic Product (GDP) of SIDS (United Nations, n.d.). This dependency means that state revenue—derived heavily from Value Added Tax (VAT), customs duties, and departure taxes—can fluctuate up or down during boom years or down years.

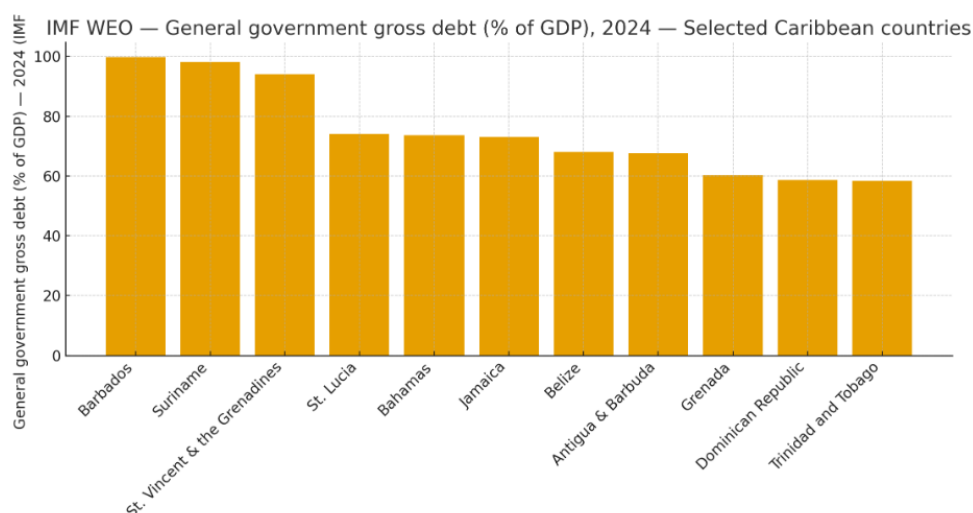
The volatility of this revenue structure was vividly exposed by the COVID-19 pandemic. In 2020, tourist arrivals across the Caribbean region declined by 67% compared with the previous year (United Nations, n.d.). This immediate reduction in economic activity caused a corresponding decline in government tax receipts. This effect eliminated the fiscal space for nonessential or long-term investments. Scheduled subventions to regional universities and national colleges are generally the first expenditures to be cut or delayed, demonstrating the direct and immediate link between external market shocks and the instability of higher education financing (Diris & Ooghe, 2018). When fiscal resources are severely constrained, governments must make stark trade-offs among critical, competing public demands. Post-pandemic, investment in health systems, social safety nets, and remarkably resilient infrastructure—essential for climate adaptation—takes precedence (CAF, 2025; UNOPS, n.d.). Higher education, which is important for long-term development but whose returns are realized slowly, is consistently displaced by immediate needs, creating a cycle of under-resourcing for the HE sector.

Sovereign Debt and Fiscal Constraints on Social Sector Spending

The historical high levels of sovereign debt constitute a fiscal crisis for many Caribbean SISs, directly limiting the state's capacity to invest in higher education. In 2024, approximately one-third of SICS had public debt-to-GDP ratios exceeding 60%, with some countries exceeding 80%, placing them at “high risk” of debt distress (DFI, 2024; PreventionWeb.net, 2024).

Figure 1

Debt to GDP for Caribbean Countries 2024



Source: IMF World Economic Outlook (WEO) / IMF Data Mapper – (% of GDP), 2024.

This substantial debt stock forms a significant portion of the annual government revenue structure. The implication of this debt has a significant curtailment of the fiscal space available for strategic development spending in HE. This figure is drastically higher than the 15–20% range that international financial institutions often deem a sustainable threshold. Such a high commitment to creditors crowds out funding for the Sustainable Development Goals (SDGs), including quality education, resulting in movements away from necessary resources for long-term national human capital development (CPDC, 2023; DFI, 2024).

Why can HEIs not rely on government subsidies? The stark reality of this fiscal constraint is evident in the comparison between debt service and social sector expenditure. For Latin American and Caribbean (LAC) SIDS, debt service payments (averaging 42% of budget revenue) are significantly greater than the combined expenditure on all social sectors (averaging 35%) (DFI, 2024). This structural imbalance guarantees a stark underfunding crisis for higher education. Without substantial debt relief or mechanisms to free up fiscal space, HE institutions cannot rely on consistent government subventions, leaving them financially vulnerable and unable to plan for the future.

Challenge 2: Disproportionate Vulnerability to Climate Change

The Caribbean SIS shows a disproportionate vulnerability to climate change and exogenous shocks. These shocks can have the effect of eliminating decades of economic progress and financial stability. Despite contributing less than one percent to global greenhouse gas emissions, the Caribbean small states are exposed to frequent and intense natural hazards (World Bank, 2021). The average annual cost of damage from these disasters, particularly

tropical cyclones, is significantly higher than the global average (United Nations, n.d.). The cost implications of these disasters add further fiscal complications to HE, competing with healthcare and social services following disasters.

The economic cost of climate events is catastrophic and often uninsurable. Between 1995 and 2022, tropical cyclones alone caused an estimated US\$45 billion in damage across the Caribbean (PreventionWeb.net, 2024). Table A in the Appendix presents the approximate cost of damage resulting from climate-related activities in the Caribbean over the past decade.

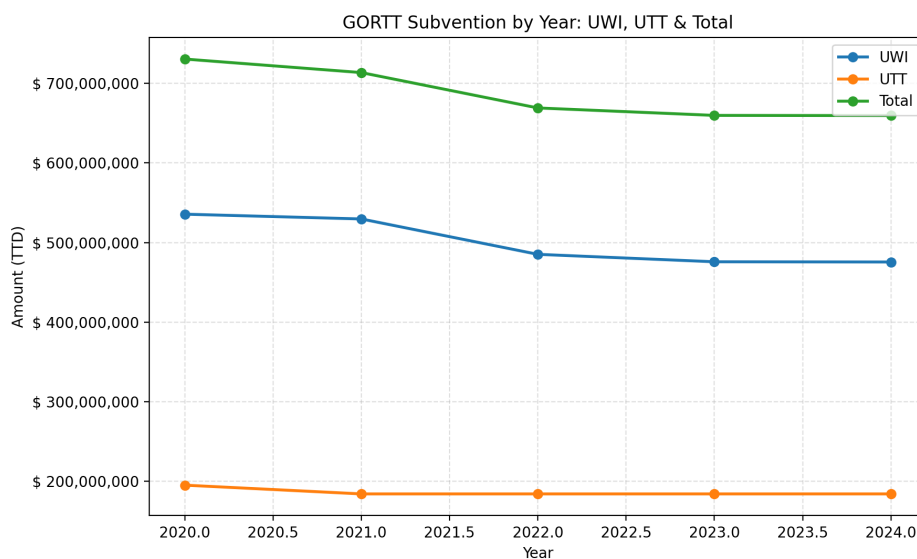
On average, in years when a storm strikes a country, the economic losses can equal 17% of its GDP (UNDP, n.d.). These losses are not merely a drain on national wealth but a compulsory diversion of funds. Climate-related damage not only consumes immediate fiscal space but also compounds the long-term debt problem, perpetually limiting future investments in the HE sector.

Challenge 3: Institutional Funding Sources

Faltering Government Subventions to Regional Institutions

Perhaps the most pressing financial challenge facing regional higher education (HE) institutions, such as UWI and UTT systems, is the systemic failure of contributing Caribbean governments to meet their mandated subventions. The typical Caribbean HE funding model is based primarily on the “economic cost” formula and requires UWI member states to provide the majority of the university's operational budget. However, perpetual economic vulnerabilities, mounting sovereign debt, and narrow tax bases frequently result in significant, delayed payments and sustained arrears (UWI, 2020). Some governments, such as Trinidad and Tobago, acknowledge these financial difficulties and pledge to settle outstanding arrears in subsequent fiscal years (Ministry of Finance, 2024). However, these pledges sometimes come in delayed disbursements, leading to severe cash-flow and strategic-planning instability for the entire regional university system. Figure 2 shows the government of Trinidad and Tobago's subventions to UWI and UTT for the period 2020 to 2024.

Figure 2
GORTT Declining Subventions to UWI and UTT 2019–2024



Source: UWI & UTT annual reports 2020–2024

This delay and underfunding have a significant impact on the quality and maintenance of educational infrastructure. The reliance on government grants—a primary funding source alongside tuition—means that when subventions are delayed or reduced, core operational expenditure suffers. Capital expenditure necessary for maintenance and modernization, such as updates to technology platforms, repairing physical infrastructure, or investing in climate-resilient facilities, is often the first casualty of fiscal constraint. Without timely investments, structural delays occur, compromising the long-term integrity and technological relevance of the regional HE provision. Consequently, the sector remains highly sensitive to the political and economic cycles of its contributing countries, limiting its potential to transition into a truly competitive, entrepreneurial, and globally ranked HE provider (UWI, 2020).

Increasing Tuition Burdens and Their Impact on Low-Income Students

Given the reality of the financial constraints brought on by reduced and delayed government funding, HEIs may consider a gradual shift toward greater cost-sharing, primarily through increased tuition fees (Blancaneaux, 2022). This trend directly contradicts the historical philosophy of subsidized higher education as a public good aimed at equitable national development. The growing reliance on tuition to close budget gaps poses a significant threat to educational equity and access, particularly for students from low-income families. While some mitigation to ease this student burden comes from nations that offer scholarship or financial aid programs, these are often insufficient to cover the full spectrum of educational costs, including tuition, accommodation, books, and living expenses. The implication of this measure results in delayed student enrollment, working full-time while studying, or withdrawing from higher education entirely, creating a barrier that affects vulnerable groups (ParlAmericas, n.d.).

Moreover, the perception of high tuition costs, coupled with increasing uncertainty about employment prospects, is prompting prospective students to question the Return on Investment (ROI) of a university education (UWI Quality Education Forum, 2021). This market-driven questioning, particularly evident in the post-pandemic environment of increased unemployment, suggests that rising tuition is not only an access issue but also a demand issue. Under the circumstances, a comprehensive needs-based financial aid scheme becomes a requirement to truly ease the burden on families. The Caribbean risks creating an HE system that only serves the socio-economic elite, undermining its fundamental purpose of broadening access to HE.

Challenges to Equitable Access in National Colleges

Beyond the regional university system, national colleges and technical institutions play a vital role in providing access to higher education, often serving local and vulnerable populations with more vocational and applied training. However, these institutions face unique equity challenges, primarily due to insufficient financial resources and the digital divide. While national colleges often have lower nominal tuition fees than regional universities, these colleges often lack robust student support services, modern learning technologies, and adequate physical infrastructure to ensure equitable student success (ParlAmericas, n.d.).

A significant barrier to equitable access is the technological and geographical isolation experienced by many students. COVID-19 initiated a rapid technological response to educational delivery. In Caribbean SISs, this sudden shift to eLearning exposed the region's disparities in internet access, reliable broadband, and the availability of personal computing devices. Students in remote or rural areas, or those from lower-income households, were

disproportionately affected by the “digital divide,” creating unequal learning outcomes and heightening the risk of dropout.

Caribbean institutions struggle to attract and retain highly specialized faculty due to limited resources for competitive salaries and professional development. This issue impacts the quality of instruction and limits the expansion of leading-edge programs required by the evolving labor market. Equitable access in national colleges thus requires not only mitigating direct financial costs through subsidies but also strategic public investment in robust, decentralized digital infrastructure and capacity-building. This can provide the much-needed support to ensure that high-quality, relevant education is delivered consistently across all demographic groups and geographic areas.

Challenge 4: Administrative Barriers

Limited Technical and Administrative Capacity (Human Capital)

Expertise, human capital, and administrative capacity continue to be significant challenges in securing sustainable HE financing. This competency gap is more prevalent in the public service and presents a limitation in the technical and administrative capacity of government ministries and HEIs. This capacity constraint manifests as a difficulty in complex tasks such as long-term financial modeling, sophisticated scenario planning, and the rigorous monitoring and evaluation required by multilateral donors (Dougherty, 2016). The frequent high turnover and sometimes transfer of personnel within key government ministries, coupled with resource constraints, means that specialized knowledge often leaves with staff, hindering institutional memory and operational effectiveness (GCA, 2025).

This capacity gap is particularly acute in modern, innovative financing. The institutions often lack the specialized expertise needed to effectively develop “bankable” projects that meet the stringent requirements of international private investors or Multilateral Development Banks (MDBs). While capacity-building efforts are important for policy and infrastructure projects, similar targeted technical assistance is needed within HE institutions to enable them to diversify their funding portfolios and manage financial instruments independently.

Navigating Complex Multilateral and Climate Finance Mechanisms

Accessing non-traditional funding streams, particularly global climate finance, presents a formidable administrative barrier for Caribbean HEIs and, by extension, the governments that fund them. Although SIDS collectively require approximately US\$12 billion annually for climate adaptation, the mechanisms for accessing this finance are not designed with the unique constraints of small island states in mind (Climate Policy Initiative [CPI], 2025). This complexity creates a significant challenge of “absorption capacity.”

The application processes and the necessary project documents to access global funding can be both complex and bureaucratic. The Green Climate Fund (GCF) or MDB adaptation windows are notoriously long, bureaucratic, and highly technical. Ministries of Education and university administrators across the Caribbean often lack the human resources to commit to the rigorous process of developing project concept notes – a tasks that entail conducting detailed climate risk assessments, and compiling the extensive technical documentation required by these bodies. The implication of arising out of this capacity gap is that even when funding is

theoretically available, SIDS are effectively locked out due to the high transaction costs and complexity of the application process (CPI, 2025).

Furthermore, while MDB funding has increased, its structure is not always aligned with the developmental needs of the HE sector. Although the GCF has been the largest multilateral source of funding for SIDS, a significant portion of international public adaptation finance to SIDS is still provided as debt (44% in 2021–2022). This exacerbates the existing debt sustainability risks (CPI, 2025) and forces HEIs to critically evaluate whether pursuing climate finance for infrastructure resilience, though necessary, will ultimately lead to further macroeconomic instability for their host governments. The consequence of this is a deepening of the funding crisis for core academic functions.

Policy Alternatives and Avenues for Sustainable Financing

Reforming International Financial Metrics

The Gross National Income (GNI) per capita as a concessionary financing metric is a significant hurdle to sustainable financing in the Caribbean, inclusive of higher education (UN DESA, 2022). Low populations in member Caribbean states often inflate GNI, leading to reclassification of country status to “graduate,” thus preventing concessionary financing. The implications of this reclassification mean that nations highly vulnerable to existential external shocks are forced to finance recovery and essential social services, such as higher education, through commercial or non-concessional loans, thereby dramatically escalating their debt burden (GOV.UK, 2019).

Another limitation in the GNI model is its failure to account for structural economic and environmental vulnerabilities. Because of diseconomies of scale, small domestic markets, and geographical remoteness, there is a higher probability of extremely high per-unit costs for imported goods, energy, and infrastructure maintenance (LSE, 2024). Furthermore, when climate shocks are factored into the financial model, the impact is disproportionately high; Hurricane Maria in 2017, for instance, caused damages estimated at 226% of Dominica's GDP. This illustrates how a single event can instantly eliminate decades of economic progress and significantly increase debt (AOSIS, 2022). These vulnerabilities necessitate constant, large-scale investment in resilient infrastructure—including educational facilities—which national budgets alone cannot meet. High vulnerability, masked by a high GNI per capita, can cause countries to be denied the affordable capital needed to ensure fiscal space for public services such as education.

Multidimensional Vulnerability Index (MVI) as a New Basis for Concessional Finance

The proposed solution championed by SIDS for decades is the adoption of the Multidimensional Vulnerability Index (MVI) to complement, not replace, GNI per capita in determining eligibility for concessional finance (UN OHRLLS, 2024). The MVI model supplements the existing GNI by including structural vulnerability (e.g., small size, remoteness, dependence on specific sectors) and matters of structural resilience (e.g., limited administrative capacity, high debt exposure) across economic, environmental, and social dimensions (UN DESA, 2024). MVI scores for Caribbean SIDS are typically 50–70 percent higher than the global average, clearly demonstrating their elevated vulnerability (CSIS, 2022).

Policy implementation of the MVI can be a significant intervention for higher education financing. A globally accepted MVI, developed and integrated by international financial institutions (IFIs), can provide the evidence base needed for SIDS to secure resources for climate-resilient education infrastructure systems. The implication of an MVI policy implementation to access concessionary financing and grant-based climate funds can free up inelastic public revenues currently dedicated to debt servicing and post-disaster recovery for core HE subventions (AOSIS, 2022). This policy shift can directly provide the financial stability of institutions such as the University of the West Indies (UWI) and other Caribbean colleges, and ensure that government budgets can reliably support access and equity objectives rather than constantly reacting to external crises.

Regional Collaboration and Shared Resource Models

Regional collaboration, coupled with enhanced efficiency are additional mechanism to mitigate the absence of economies of scale. Institutions like the UWI already serve 17 countries, but deeper integration is required across administrative and technological platforms. A key strategy is the implementation of shared service and delivery models for back-office functions, including procurement, IT infrastructure, course duplication, and library resources. For instance, the Caribbean Shared Educational Resource Service (CSERS) aims to pool access to digital content, making educational materials more affordable across the region (DataLore Inc., 2020). Although CSERS has had limited success, it presents tremendous potential for Caribbean higher education institutions. Through standardization of administrative processes and consolidating procurement activities, HEIs' operating costs can be optimized. Beyond administrative efficiency, regional strategies must focus on academic quality and knowledge transfer. Initiatives involving UWI, UTT, and partner institutions, such as the EU-funded project on Mainstreaming Energy Efficiency and Climate Change in Built Environment Training and Research, demonstrate successful capacity building through joint curriculum development and research mobility (EU-LAC Foundation, 2019). Furthermore, the implementation of a universal regional credit transfer system can facilitate student mobility. This measure can ensure specialized, high-cost programs (e.g., Engineering, Medicine) can be efficiently centralized at one campus, serving the needs of the entire region and avoiding costly duplication of resources in smaller national colleges (EU-LAC Foundation, 2019).

Developing Resilient Educational Infrastructure and Digital Delivery

Operational continuity and efficiency require that the educational planning include financing climate-resilient educational infrastructure is an integral part of capital investment. The high incidence of hurricanes and floods in the region routinely results in damaged school buildings, prolonged learning disruptions, and damages costing millions, e.g., Hurricane Beryl caused over US\$16.6 million in damages to Jamaica's education sector in 2024 (Global Partnership, 2025). The policy alternative is to proactively integrate disaster risk reduction into all HE infrastructure planning. Access to global funding agencies/instruments, such as the Green Climate Fund (GCF) and the World Bank's resilient transport/infrastructure programs (World Bank, 2024) become integral to HE infrastructure financing. Reports suggest that investing just \$1 in climate-resilient infrastructure can yield savings of approximately \$4 in post-disaster rebuilding costs (Commonwealth, 2024).

Accessibility and educational reach are integral to the philosophy of broadening higher education access. Further strategic investment in digital delivery and e-learning platforms offers both disaster resilience and economies of scale. Digitalization enables education systems

to continue operating during periods of physical disruption (e.g., pandemics, storms), thereby protecting learning continuity (Commonwealth, 2024). The policy shift must be supported by blended finance models that invest in high-speed, reliable, and regional internet connectivity, as well as centralized digital platforms. This intervention enables the delivery of specialized courses at lower marginal cost to a larger number of students across different SIS, effectively decoupling educational costs from physical location and mitigating the structural financial disadvantage posed by small populations.

Diversifying Domestic Revenue Streams

In the context of dwindling government transfers to HEIs, private capital becomes an attractive mechanism to augment any financing shortfalls. Strategic Public-Private Partnerships (PPPs) can mobilize private capital and expertise to bridge infrastructure and service gaps resulting from constrained public budgets. In the Caribbean, PPP has had limited success, primarily focusing on skills training. The alternative is to move toward structured, transparent PPPs for non-core academic functions (Ansari, 2023). Examples include private financing and management of student housing, campus facilities (e.g., laboratories, tech hubs), and administrative services (IDB, 2022). This allows universities to focus their limited public subventions on core academic delivery, research, and student financial aid.

However, the implementation of PPPs must be aligned with the necessary administrative and risk management capabilities to mitigate against cost overruns and loss of public control (Medium, 2023). PPP policies must ensure transparent procurement processes and clear performance-based contracts, prioritizing social equity over profit maximization to avoid excluding vulnerable students (Medium, 2023). The PPP models can involve aligning the private sector's need for skilled labor with the HE curriculum through Industry-Academic Partnerships, such as the UWI-Coventry Institute or the Indian Institutes of Technology (IIT) business incubation projects. These initiatives aim to promote innovation and entrepreneurial ecosystems, thereby turning private-sector investment into a revenue stream linked to student training and job outcomes (UWI, 2023).

Implementation of Needs-Based Financial Aid and Student Loan Schemes

While high tuition is a barrier to access, public funding should be redirected from broad, poorly targeted subsidies towards a needs-based financial aid system. High government subvention often masks inefficiencies and fails to achieve equitable access, as the principal beneficiaries are often students who could afford to contribute more (UWI, 2023). A comprehensive review of the existing student aid systems and the implementation of a more rigorous, means-tested financial aid system—including grants for the most vulnerable students—can ensure that limited public funds are efficiently targeted to those with the greatest need, thereby protecting the equity mandate of HE.

These financial aid schemes must be designed to be resilient to the economic cycles of small economies and cannot merely mimic commercial bank offerings. Furthermore, innovative repayment models, such as income-contingent loans (ICL), should be explored. Under an ICL model, repayment begins only after the graduate's income exceeds a certain threshold, mitigating the risk of graduate debt distress and stabilizing the loan fund's long-term revenue stream, thereby ensuring the scheme's sustainability as a revolving fund for future cohorts.

Conclusion

The research presented in this paper confirms that Higher Education (HE) financing in Caribbean Small Independent States (SIS) encompasses a cycle of compounding vulnerability driven by a fiscal trilemma. Severe diseconomies of scale have resulted in significantly higher per-student operating costs compared to larger nations. There is structural fragility heightened by inelastic public revenues and a disproportionate exposure to climate-induced disasters. These inelastic revenue sources force governments to divert essential HE subventions toward immediate disaster relief, leaving institutions like the UWI and the UTT in a precarious, reactive financial posture. The implication of a compromised sustainability has triggered a growing social equity crisis, as declining public support compels institutions to implement tuition and fee adjustments. This shifts the financial burden onto vulnerable students, thereby eroding equitable access. To mitigate these systemic issues, policy initiatives must transition from traditional grant-dependency toward innovative, climate-resilient financial instruments. Integrating HE infrastructure into national disaster risk financing frameworks must now be an integral part of HEIs' planning. Governments must incentivize HEIs to diversify revenue through strategies of the Blue and Green Economy by developing industry-aligned research hubs and utilizing Resilience Bonds or Debt-for-Education Swaps to secure long-term capital while reducing sovereign debt. Further, through alignment with these investments with the Multidimensional Vulnerability Index (MVI), SIS can advocate for favourable concessional financing that recognizes HE as a critical pillar of national climate resilience. Going forward, scholarly investigations must prioritize themes such as leveraging the MVI for specialized infrastructure loans, analyzing the diseconomies of scale within digital campus transformations, and developing spatial-financial risk models for coastal campus assets to predict long-term maintenance costs. Additionally, future research can explore the impact of sovereign debt restructuring on tuition policy, the feasibility of public-private resilience partnerships as dedicated revenue streams, and the behavioural economics of student debt in a region characterized by high climatic and economic volatility.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The author declares that Grammarly, an AI-assisted writing software, was used in proofreading and refining the language used in the manuscript. The usage was limited to correcting grammatical and spelling errors and rephrasing statements for accuracy and clarity. The ideas, design, procedures, findings, analyses, and discussion are originally written and derived from appropriate and systematic conduct of the research.

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Appendix

Table A
Caribbean Climate-Related Activities and Cost of Damages

Year	Name of Hurricane/Storm	Caribbean Countries Affected (Major Impact)	Approximate Cost of Damage (USD)
2025	Melissa (Cat 5)	Jamaica, Cuba, Bahamas	> \$10.555 billion (Season Total, mostly from Melissa)
2024	Beryl (Cat 4)	Grenada, Jamaica, Cayman Islands	> \$3.4 billion (Dorian, 2019) + Beryl, Oscar, etc.
	Oscar (Cat 3)	Bahamas, Turks & Caicos	Included in 2024 total
2022	Ian (Cat 5)	Cuba, Cayman Islands	> \$1.1 billion (Cuba only)
2021	Elsa (Cat 1)	Barbados, Saint Vincent and the Grenadines, Saint Lucia, Jamaica	~\$50 million (Barbados, St. Lucia)
2020	Eta (Cat 4)	Nicaragua, Honduras, Guatemala, Belize, Cayman Islands, Jamaica	> \$1.4 billion (Central America/Caribbean total)
	Iota (Cat 5)	Nicaragua, Honduras, San Andrés (Colombia)	~\$1.4 billion (Nicaragua/Colombia total)
2019	Dorian (Cat 5)	The Bahamas (most severe), Puerto Rico, US Virgin Islands	~\$3.4 billion (The Bahamas only)
2018	Michael (Cat 5)	Cuba, Yucatán Peninsula (Mexico)	~\$200 million (Cuba only)
2017	Irma (Cat 5)	Barbuda, Saint Barthélemy, Saint Martin, British Virgin Islands, Cuba, Turks and Caicos, Puerto Rico	~\$64.8 billion (Total including US impact)
	Maria (Cat 5)	Dominica, Puerto Rico, US Virgin Islands, Guadeloupe, Dominican Republic	~\$91.6 billion (Total including US impact)

Year	Name of Hurricane/Storm	Caribbean Countries Affected (Major Impact)	Approximate Cost of Damage (USD)
2016	Matthew (Cat 5)	Haiti, Cuba, Dominican Republic, The Bahamas	~\$10.9 billion (Total including US impact)
2015	Joaquin (Cat 4)	The Bahamas, Haiti, Turks and Caicos	~\$210 million
	Erika (Tropical Storm)	Dominica, Puerto Rico	~\$483 million (Dominica only)

Source: National Hurricane Centre (NHC) Tropical Cyclone Reports (TCRs); Relief Web (UN Office for the Coordination of Humanitarian Affairs), Economic Commission for Latin America and the Caribbean (ECLAC), International Monetary Fund (IMF) reports