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SOLUTIONING THE IMPACTS OF CLIMATE CHANGE: RESEARCH AND OTHER SCHOLARLY ACTIVITIES CURATED BY RESEARCH MANAGERS AT JAMAICA'S LEADING PUBLIC UNIVERSITY

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ABSTRACT

What is new?	Research Managers at Jamaica's leading public university have curated for the first time and presented in this paper research and other scholarly activities undertaken by their institution to mitigate the adverse impacts of climate change on Small Island Developing States (SIDS) such as Jamaica.
What was the approach?	Mining and analysis of the research database maintained by the University's research management office and a review of relevant literature on climate change were undertaken.
What is the academic impact?	The diverse, impactful scholarly output highlights the strong commitment of the University to its mission, significantly advancing the understanding and mitigation of the adverse effects of climate change, particularly within the context of SIDS.
What is the wider impact?	This paper underscores the important role of higher education institutions on climate change and makes recommendations on how other universities can contribute

to climate action. It also provides insights on the critical role of research managers in supporting impactful research, engaging in research information management, and disseminating their institution's research. The paper ends with further initiatives the University's research management office will be implementing concerning climate change and the enabling capacity building activities for its research managers.

Keywords: Climate Change, SIDS, Caribbean, Jamaica, Research Management

INTRODUCTION

The University of Technology, Jamaica (UTech, Jamaica) is the country's oldest publicly owned University. The institution was established by 'The University of Technology, Jamaica Act' (Act 27 of 1999) of the Jamaican Parliament; this was an upgrading to university status of the College of Arts Science and Technology (CAST), which had been operating since 1958 as a polytechnic-type training tertiary-level institution.

The "Objects" of UTech, Jamaica are to: "(a) advance education and development of technology through a variety of patterns, levels, and modes of study and by a diversity of means by encouraging and developing learning and creativity for sustainable development for the benefit of the people of Jamaica, the Caribbean and elsewhere; (b) preserve, advance and disseminate knowledge and culture through teaching, scholarship, and research; (c) make available the results of such research and service; and (d) promote wisdom and understanding by the example and influence of corporate life" (Parliament of Jamaica, 1999).

The mission of the University of Technology, Jamaica is: "To positively impact Jamaica, the wider Caribbean and elsewhere through high quality learning opportunities, research and value-added solutions to government, industry and communities" (Uuniversity of Technology, Jamaica, Strategic Plan, 2021-2025).

In this paper, Research Managers at UTech, Jamaica first outline the architecture of the institution's research management ecosystem. They then present curated findings from mining and analyzing their database, which highlights impactful research and other scholarly activities on climate change conducted by staff members and graduate students.

OVERVIEW OF UTECH, JAMAICA'S RESEARCH MANAGEMENT ECOSYSTEM

It is generally agreed that research performance is one of the key indicators that sets a university apart from other post-secondary institutions (Organization for Economic Cooperation and Development, 2004). Also, research is central to the very appealing idea of the university as an autonomous entity with the freedom to make its own rules (Lemann, 2014).

To implement a coherent research agenda and a supporting ecosystem of research management, UTech, Jamaica initially established the Office of Research and Graduate Studies (ORGS) (Onyefulu & Ogunrinade, 2005, Ivey et al., 2012). The School of Graduate Studies, Research, and Entrepreneurship (SGSRE), with a broader mandate, replaced the ORGS in 2007 as the *macro-level* unit responsible for Research and Innovation Management (RIM) at UTech, Jamaica (Ivey et al., 2012). The staff complement of the SGSRE comprises an Associate Vice President, technical officers, and administrative support officers.

The SGSRE has been designated 'owner and driver' of UTech, Jamaica's strategic research-related initiatives and is required to provide periodic performance status reports to the university's Executive Management, which in turn reports to the Governing Council. Supporting the work of the SGSRE in a 'hub and spoke' model are College/Faculty Graduate Studies, Research, and Entrepreneurship Coordinators (C/FGSRECs) serving as *micro-level* Research Managers and the critical link between the SGSRE and the various academic units within the university (University of Technology, Jamaica, Research Policy, 2009; Ivey et al., 2012, 2013).

According to the Association of Commonwealth Universities (ACU), research management is a set of activities, structures, and processes that support the planning, conduct, and dissemination of research within universities or research institutions. Research management is aimed at ensuring that research is conducted efficiently, ethically, and in alignment with institutional and national priorities (ACU, 2006).

Research Support Provided to Staff at UTech, Jamaica

Recognizing the importance of research to its legitimacy as a university and the benefits that will accrue to its 'proximate stakeholders' (i.e. primarily the people of Jamaica) from its research output if it remains faithful to its mission, UTech, Jamaica through its research and innovation management office (the SGSRE) has intentionally implemented several initiatives and provides a suite of pre- and post-award support services aimed at promoting and encouraging staff involvement in research. These support activities that are in alignment with those articulated by Research Africa (2013) include, but are not limited, to:

1. Advice and assistance with sponsored research, grants, and contracts for research and scholarly activities;
2. Identification and negotiation with potential partners and collaborators;
3. Help with interpreting and complying with university policy and procedures;
4. Capacity building workshops on grant proposal writing and other relevant matters;
5. Provision of information regarding the interpretation and application of the university's Intellectual Property Policy, including assistance with the filing of patents and registering copyrights.

The SGSRE also manages the Research Development Fund (RDF), which is an internal research grant fund supported from the university's budget. The RDF provides funding for the following activities:

1. Research projects;
2. Publication fees for peer-reviewed books, book chapters, and journal articles;
3. Research capacity-building activities;
4. Protection of intellectual property;
5. Article processing fees for papers accepted for publication by peer-reviewed journals;
6. Conversion of conference presentations to journal papers;
7. Development of publications derived from theses/dissertations;
8. Hosting of conferences by academic units.

In addition, the SGSRE is responsible for coordinating the selection annually of the awardee for the President's Research Award (PRA), which is the university's most prestigious award. The purpose of the award is to stimulate research and scholarly activities by encouraging and supporting individuals who demonstrate exceptional ability through their scholarly activities, research publications, research income generation through grants secured, creative research activity, and other research performance.

The SGSRE also has responsibility for publishing the *Journal of Arts Science and Technology (JAST),* which is the university's peer-reviewed journal. JAST publishes peer-reviewed papers aligned with the disciplines of its two colleges and five faculties. The journal is published twice per year and is a medium for staff members to publish their research, alongside that of researchers from other institutions and countries.

Additionally, the SGSRE is the chief organizer of UTech, Jamaica's annual Research, Technology & Innovation Day, which provides an opportunity for the university's staff members and students to display its research work and capabilities to stakeholders. The event facilitates interaction between the university and its various publics. In so doing, the university not only showcases the research work of its researchers, which is of value to the society, but also seeks to forge strong linkages with industry, academia, and government (Ivey et. al., 2012; Ivey et al., 2013).

Climate Change in Context

Climate Change Defined

Climate change is the long-term modifications in the Earth's climate, in particular major alterations in its temperature, precipitation, and weather patterns. The main contributor to modern climate change is global warming that results from human activities which increase the concentration of greenhouse gases in the atmosphere, leading to the trapping of heat. There is an inextricable interdependence of climate, ecosystems and biodiversity, and human societies. Besides, close linkages exist between climate change

adaptation, mitigation, ecosystem health, human well-being, and sustainable development (IPCC, 2023).

Global Warming, Causes, and Impacts

In terms of causes and impacts, credible evidence shows that human activities, mainly through greenhouse gas emissions, have caused global warming, raising global temperatures by 1.1°C since pre-industrial times. Emissions continue to rise due to unsustainable energy use, land use, consumption, and production patterns, with unequal contributions across regions and individuals. Climate change has already triggered widespread and rapid changes in the environment, increasing extreme weather events and causing significant harm to both nature and people. Vulnerable communities, despite contributing the least to climate change, are disproportionately affected (IPPC, 2023).

Implications of Climate Change for Small Island Developing States (SIDS)

Small Island Developing States (SIDS) are an assemblage of small island countries that have similar sustainable development challenges as well as similar social, economic and environmental vulnerabilities (UNDP, 2024). They face severe challenges due to climate change, as they are highly vulnerable to its impacts. Located mainly in the Caribbean, Pacific, and Indian Oceans, these islands experience rising sea levels, extreme weather events, freshwater shortages, marine ecosystem threats, economic instability, climate-induced migration, and cultural heritage loss. Climate change also exacerbates their financial and development difficulties (Betzold, 2015).

SIDS are highly exposed to hurricanes and other extreme weather events, which are becoming more frequent and more intense due to climate change impacts, causing significant loss and damage to people, infrastructure, and crops. From 1970 to 2020, SIDS lost US$153 billion due to weather extremes, a significant amount relative to the average GDP for SIDS, $13.7 billion. These impacts are increasingly driving displacement, with small island states in the Caribbean and South Pacific being disproportionately affected relative to their population size. Approximately 22 million people in the Caribbean live less than six metres above sea level and most Pacific islands have over half of their infrastructure within 500 metres from the coast (UNDP, 2024).

Climate Change Impacts, Policy, and Initiatives in Jamaica

According to the Climate Change Knowledge Portal of the World Bank Group, Jamaica "faces very serious threats from hotter temperatures, droughts and floods linked to climate change, and an existential threat due to sea level rise." (World Bank, 2024). Jamaica's socio-economic inequalities also amplify the climate vulnerability of particular segments of its population. What is more, although Jamaica contributes little to global greenhouse gas emissions, climate change poses a major threat due to its reliance on vulnerable sectors like tourism and agriculture. The country faces economic risks,

biodiversity loss, ecosystem degradation, and threats to food, water security, and public health (GOJ, 2023).

Having realized the importance of addressing climate change, Jamaica became a Party to the Paris Agreement on Climate Change in 2017 and has committed to increasing its level of ambition in mitigating and adapting to climate change. A Climate Change Division (CCD) has been established within Jamaica's Ministry of Economic Growth and Job Creation (MEGJC), and the government has also approved a *Climate Change Policy Framework* in 2015 (updated in 2017). The updated *Climate Change Policy Framework for Jamaica* aims to support sustainable growth and prosperity by enhancing the country's resilience to climate change. Key strategies include reducing vulnerability, promoting low-carbon development, increasing access to climate finance, and raising public awareness through education, research, and technology transfer. The policy aligns with *Vision 2030 Jamaica - National Development Plan*), particularly Goal 4, which focuses on maintaining a healthy natural environment, as well as National Outcomes 13 and 14 on resource management and climate adaptation. Ultimately, it seeks to mitigate climate risks across all sectors to safeguard Jamaica's development goals (Planning Institute of Jamaica, 2010; GOJ, 2023).

At an international climate change conference hosted by UTech, Jamaica, on October 17, 2024, Jamaica's Prime Minister expressed concern over Jamaicans' lack of responsiveness to climate change. He urged universities to play a more active role in making complex climate issues accessible to the public, emphasizing that knowledge should not remain confined within academic institutions. The Prime Minister stressed the need for universities to combat misinformation and ignorance by engaging with society and helping citizens make informed decisions. For his part, the President of UTech, Jamaica, while also addressing the same international conference, highlighted rising temperatures in Jamaica, noting the University's increased reliance on air conditioning and its efforts to cut energy costs through a new solar project. Emphasizing the University's commitment to tackling climate change, the President stated that the institution aims to become research-intensive and leverage its experts and students to develop solutions for Jamaica and the region (Dunkley-Willis, 2024).

The dire implications of climate change for SIDS, such as Jamaica, underscore the importance of research and other scholarly activities on climate action by Jamaica's leading public university.

METHODOLOGY

Two approaches were employed in this study:

1. A review of the literature on climate change, and
2. Database mining.

Literature review. The UTech, Jamaica research managers reviewed the pertinent literature on climate change, a summary of which is presented in the previous section on climate change in context. According to Booth et al. (2016), to gain an

understanding of a subject matter, a review of the existing body of knowledge in the field is important to place current work into the broader academic context.

Database mining. Database mining refers to the process of finding patterns, relationships, and insights from datasets using various techniques. It involves pulling useful information from raw data to assist with decision-making (Han et al., 2011). Since 2007, when the SGSRE was established and replaced the ORGS as UTech, Jamaica's research management office, the research managers have maintained a database of research done by staff members and graduate students. The research managers mined this database through a keyword search ('climate change') to identify related research projects and other scholarly activities. The sequence of actions was as follows: Keyword search of research database > Climate change 'hits' noted > 'Hits' counted and categorised by type > Academic units identified > Research Producers (staff vs. students) identified.

RESULTS

TYPES OF SCHOLARLY WORKS

The keyword search conducted by research managers in UTech, Jamaica's research database identified 34 research and scholarly works on climate change by staff and students. These results ('hits') were grouped into five categories (Table 1). The academic units undertaking climate change research were also identified (Table 2). In addition, the 'hits' from staff and students were also noted (Table 3).

Table 1: Research and scholarly activities on climate change

Activity	Count
Curriculum Development and Capacity Building	3
Staff Research Projects	2
Peer-reviewed Journal Papers and Conference Presentations	15
Service Scholarship	6
Graduate Students' Research	8
Total	34

CURRICULUM DEVELOPMENT AND CAPACITY BUILDING

Master's Degree in Sustainable Energy & Climate Change

The Caribbean Sustainable Energy and Innovation Institute (CSEII) at UTech, Jamaica, pioneered the development of a Master of Science programme in Sustainable Energy and Climate Change (MSSECC) with the technical and financial support of the German Society for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) through the Caribbean Community (CARICOM) Secretariat

following two years of developmental work led by the University's Associate Vice President for Sustainable Energy.

The concept for this specialist degree programme was premised on UTech, Jamaica's thrust to advance training in sustainable energy and climate change management throughout the Caribbean Region focussing on innovation and entrepreneurship. Like most of its CARICOM partners, Jamaica has been overly dependent on imported fossil fuels to meet its energy needs. This energy poverty has negatively impacted these nations in realising their economic, social, and political objectives or to meet the Global Goals for Sustainable Development. The time had come for an acceleration in looking beyond petroleum to renewable energy development in the Region even as the world was facing predictions of the dire impacts of climate change especially on Small Island Developing States.

In 2009, Jamaica developed a National Energy Policy 2009-2030 that articulated its vision for a modern, efficient, diversified, and environmentally sustainable energy sector providing affordable and accessible energy supplies with long-term energy security and supported by informed public behaviour on energy issues and an appropriate policy, regulatory and institutional framework (Ministry of Energy and Mining, 2009; Potopsingh & Alcock, 2022). The development of seven sub-policies subsequently further created the opportunity for capacity building. The need for capacity was supported by the Ministry of Labour and Social Security publication on Labour Market Trends and Prospects for Employment Opportunities (2015). Research in the wider Caribbean conducted on the Technical and Professional Baseline Analysis under an Inter-American Development Bank-funded project showed the need for similar capacity building within the Caribbean region (Rademaekers et al., 2014). New approaches would be necessary to address the nexus between energy and climate change and to create new strategies and programmes for young scientists to offer innovative solutions.

The philosophy of this Master's programme was an innovation-driven, problem-solving approach, preparing students who are responsive to the global drivers for green business development linked to climate change and sustainable energy. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), CARICOM Energy Unit, and CSEII conducted a Cross-Faculty Workshop in July 2015 to build the internal synergies required for the proposed programme. This was followed by dialogue with industry stakeholders to ensure the programme's relevance to them (Potopsingh, 2015; Ivey & Potopsingh, 2023).

The programme differentiated itself in many ways from the traditional teacher-centric approach, and so the art and science of andragogy are deployed in interactions between students and teachers. Teacher-centricity has dogged the Caribbean region over centuries. Students are recognised as equals and are so treated. This barrier has not been entirely removed, but there is a better understanding among the key actors of the dynamics that the programme seeks to achieve. In addition, support mechanisms through engagement with UTech, Jamaica faculty, and international and local partners

are part of the model to build confidence in this new approach. The MSSECC has been carefully designed to ensure synergism of multi-disciplinarity; core modules that ensured this covered: sustainable energy systems; sustainable lifestyles; energy and environmental policies and economics; sustainable planning; green business entrepreneurship and innovation; bio-based economy; and data management.

The research component of a Master's degree is typically a thesis. However, in this programme, the research component seeks to have students apply what they have learned from all the core modules and an internship experience to develop an innovative business idea linked to energy, climate change, or resource management. The project is based on sound academic investigation, ethics, and research analysis and draws on learned skills and content. The output is a feasibility plan relevant to green business and entrepreneurship. Supervision is by solid academics with specialist knowledge in the fields of study and supported by industry authorities. The intention is that some research projects will lead to the creation of new businesses in energy and climate resilience (Ivey & Potopsingh, 2023).

The MSECC also aligns with the United Nation's Sustainable Development Goals (SDGs). The United Nation's global goals are the key drivers for a unified global development path. The MSECC addresses all 17 sustainable development goals. Without a doubt, energy is a crucial element in achieving all the goals, and because clean energy is linked to climate change mitigation, this mix will be as relevant in three decades as it is today. There are established principles defining sustainability/sustainable development that apply to curriculum development and management (World Commission on Environment and Development, 1987). The first cohort of students was admitted at the start of Academic Year 2017-2018. This course is offered through UTech, Jamaica's Faculty of the Built Environment in partnership with the CSEII.

Tailored Open Online Course (TOOC) for Building Climate-Resilient Cities in the Eastern Caribbean through Enhanced Urban Planning Knowledge

In 2022, the Faculty of the Built Environment (FOBE) at UTech, Jamaica was involved in the design and content development of the Tailored Open Online Course (TOOC) for the Agence Française de Développement (AFD) and Organization of Eastern Caribbean States (OECS) project, *Building Climate Resilient Cities in the Eastern Caribbean*, which was assessed as being equivalent to the content of a module that is included in the Masters of Science programme in Built Environment (MScBE) offered by the faculty. This module has been offered as a short course multiple times simultaneously while being taken by students in the MScBE programme. The AFD funded the short course participants while the MScBE students covered their costs as a regular part of their tuition in their programme. The short course participants were certified through the UTech, Jamaica Academy (the University's continuing education and professional development arm), as is standard for short courses offered by the University.

Design of a National Training Program on the Intergovernmental Panel on Climate Change Greenhouse Gas Software and Guidelines, and Carbon Accounting - Training in Green House Gas Emissions Accounting and Capacity Development in Transparency of Accounting for Jamaica

In 2023, the Climate Change Division (CCD) of Jamaica's Ministry of Economic Growth and Job Creation (MEGJC) engaged the services of UTech, Jamaica Caribbean Sustainable Energy Innovation Institute (CSEII) to design a national training program on the Intergovernmental Panel on Climate Change (IPCC) Greenhouse Gas (GHG) software and guidelines, and carbon accounting as part of its academic curricula. The scope of work involved preparing relevant training materials, including module design, slides, case studies, reference handouts, needs assessments, and course evaluations.

RESEARCH PROJECTS

Northern Blue Mountain Region Development Project – Fruitful Vale Pilot Project Climate Change Vulnerability Assessment

Undertaken by two researchers in the University's College of Business and Management in 2017, this project aimed to inform the development of a climate change mitigation plan for the rural, agrarian community of Fruitful Vale located in the Northern Blue Mountain region of Jamaica. The research focussed on:

1. Assessing the potential impact of climate variability on agriculture quality and output in the area by examining hurricane impact, landslides, and floods;
2. Assessing the adaptation measures currently adopted by farmers in the context of their belief systems and attitudes to climate change; and
3. Evaluating the available adaptation and mitigation techniques utilised in other regions of the world to recommend best practices to local farmers to reduce their socio-economic vulnerability.

Outcomes and recommendations from the project were: (1) Strengthen the adaptive capacity of the Fruitful Vale farmer through the assistance of government bodies such as the Rural Development Authority (RADA); and (2) Seek assistance to increase climate change adaptation from international donors to create an enabling adaptation environment.

The Application of Solar-Powered Polymer Electrolyte Membrane (PEM) Electrolysers for the Sustainable Production of Hydrogen Gas as Fuel for Domestic Cooking

In 2012, UTech, Jamaica successfully applied for and received grant funding of €421,000 (95% of the cost) from the European Union (EU) to undertake an innovative renewable and sustainable energy research project titled "The Application of Solar-Powered Polymer Electrolyte Membrane (PEM) Electrolysers for the Sustainable Production of Hydrogen Gas as Fuel for Domestic Cooking". The funding supported collaborative work led by a team from the School of Engineering and CSEII at UTech, Jamaica and partners from Brunel University, UK; the University of the West Indies (UWI), Mona; the

Ministry of Science, Technology, Energy and Mining (MSTEM), Jamaica; and the Bureau of Standards, Jamaica (BSJ).

The 36-month project focused on producing hydrogen gas from water as an alternative to Liquefied Petroleum Gas (LPG) cooking gas. This would reduce Jamaica's dependency on petroleum imports, which would reduce its energy bill, reduce deforestation, and increase Jamaica's renewable energy sources for improved sustainable and economic development. Using solar power to produce hydrogen gas for domestic cooking involved electrolysis of water by breaking up water molecules into hydrogen and oxygen using electricity provided by photo-voltaic power. The hydrogen produced was stored as cooking gas at low pressure in lightweight cylinders for domestic use.

Published Research and Conference Presentations

1. Sinclair-Maragh, G. (2024, July 16). Tourism and climate change: What are the implications for the 2030 agenda? [Conference presentation]. 11th Advances in Hospitality and Tourism Marketing and Management (AHTMM) Conference. Mauritius.
2. Thelwell-Reid, M. (2019, October 22). Environmental health impact of climate change: Are we prepared? [Conference presentation]. Jamaica Association of Public Health Inspectors Conference. Lucea, Jamaica.
3. Thelwell-Reid, M. (2019, September 30). Climate change and food safety [Conference presentation]. Northeast Regional Conference of Public Health Inspectors, Annotto Bay, Jamaica. September 30, 2019.
4. Ivey, P. & Potopsingh, R. (2018, July 19-20). Contributing to the UN's sustainable development goals through curriculum design aimed at producing 'innovation capable' graduates: The case of the master's degree in sustainable energy and climate change [Conference presentation]. Faculty of Science and Sport's 5th International Scientific Conference, University of Technology, Jamaica. Kingston, Jamaica.
5. Sinclair-Maragh, G. (2017). Climate change and the hospitality and tourism industry in developing countries. Climate change and the 2030 corporate agenda for sustainable development. Book Series: Advances in Sustainability and Environmental Justice, 9, 7-24.
6. Douglas-Brown, J. (2015, July 10-12). Urban design studio for energy efficient campus design and management: Mainstreaming energy efficiency and climate change in built environment training and research in the Caribbean (CarEnTrain) [Conference presentation]. Caribbean Urban Forum, St. Lucia.
7. Jardine-Comrie, A. (2014) Climate change education and school curricula in Jamaica. *Journal of Arts Science and Technology, 6(1, Supplement),* Proceedings

of the 3rd International Scientific Conference, Faculty of Science & Sport, University of Technology, Jamaica.

8. Bethune, E., Buhalis, D. & Miles, L. (2022). Real-time response (RTR): Conceptualizing a smart systems approach to destination resilience. *Journal of Destination Marketing & Management, Volume 23.*
9. Spence, D. (2022, March 17). Economic Resilience of Jamaica: Measuring economic impacts of natural disasters on employment and GDP [Seminar presentation]. College of Business and Management (COBAM) Research Seminar, University of Technology, Jamaica, Kingstin, Jamaica.
10. Green, P. & Williams, C. (2020, November). Resilience in the historic urban landscape with Geographic Information Systems [Conference presentation]. Caribbean Sustainable Cities Conference.
11. Neufville, L. (2020, May 10). Geo-mapping to guide pandemic and disaster risk preparedness responses on Jamaica's Built Environment [Conference presentation]. Faculty of the Built Environment COVID-19 Conference. University of Technology, Jamaica, Kingston.
12. Bailey, E. (2020, May 10). A Personal Experience from GROUND ZERO: Built Environment Resources and the Contribution to Social and Spatial Germination of Public Health Concerns [Conference presentation]. Faculty of the Built Environment COVID-19 Conference. University of Technology, Jamaica, Kingston.
13. Barrett-Maitland, N. (2024, February 22). Artificial Intelligence in Resilience and Recovery: Smart Engineering (Public lecture]. Faculty of Engineering and Computing Civil Engineering Department and the Jamaica Social Investment Fund (JSIF), Distinguished Lecture Series, Building Resilience in Structures. University of Technology, Jamaica. Kingston.
14. Ellis, R. & Smith-Grove, A. (2021, May). Innovative Approaches in Tertiary Education: The Case of the Master's Degree in Sustainable Energy and Climate Change at the University of Technology, Jamaica [Webinar presentation]. University of Technology, Jamaica and the Caribbean Centre for Renewable Energy & Energy Efficiency (CCREEE) Regional Universities Networking Webinar. Online.
15. Hughes, W. (2021, November 23). Driving Jamaica's Transformation through a New Green Industrial Policy [Public lecture]. Caribbean Sustainable Energy and Innovation Institute (CSEII), University of Technology, Jamaica, Kingston.

SERVICE SCHOLARSHIP

1. Hughes, W. (2022, August 30). The Impact of Rising Mortgage Interest Rates on the Real Estate Market [Webinar presentation]. Association of Land Economy and Valuation Surveying (ALEVS) Webinar. Online.

2. Campbell, A. (2024, June 23). Midwives: A Vital Climate Solution. Jamaica Observer.
3. Lewin, T., Baugh, L., Kennedy, D., Gardiner, T., Plummer, D. & Cluney, T. (2022, March 17). Examining Jamaica's Climate Change Adaptation Plan to Protect Coastal Tourism [Seminar presentation]. College of Business and Management (COBAM) Research Seminar. University of Technology, Jamaica. Kingston.
4. Archer, C. (2021, November 9). Cities and Climate Change: Project Development for Municipalities [Workshop presentation]. Caribbean Community Climate Change Centre (5C) Regional Workshop.
5. Rowe, K. (2019, February 17). Climate Change: How Does It Affect You? The Gleaner.
6. Gittens, A. (2018, February 26). Nurses' Role in Climate Change Mitigation. Western Mirror.

GRADUATE STUDENTS' RESEARCH

1. Fong, P. A.O. (2021). Aquaponics: A potential economic driver and response to climate change in Jamaica. Master of Architecture Research Project.

Abstract: Growing reliance on food imports, climate change, and water shortages has led to a decrease in traditional agricultural practices in Jamaica and the wider Caribbean. This, coupled with the impacts of rapid urbanization of the city of Kingston where little to no agriculture is done, has subsequently increased both economic hardship and food and nutrition insecurity in these regions. Considering this issue, the present study examines the integration of aquaponics as a viable alternative to traditional urban agriculture. This hydro-based solution has the potential of becoming an economic driver and a suitable response to climate change. In this vein, the study looks at the proposition of a new industry in the urban fabric which recreates food production and increases food and nutrition security in Kingston.

Keywords: Aquaponics, climate change, food security.

2. Robinson, J, McPherson, F. & Innis, L. (2020). Exploring bamboo as a suitable alternative that is biodegradable, environmentally-friendly and sustainable material for making takeaway food containers. Master of Science in Sustainable Energy & Climate Change Research Project.

Abstract: The bamboo industry is one of the fastest growing industries around the world given the steady growth of the world's population. Furthermore, rapid urbanization of towns and cities is resulting in changes in lifestyles. This includes people becoming dependent on fast food, especially amongst the working class. As such the increased number of takeaway containers that are being used is becoming a challenge for the environment especially given that the Styrofoam and plastics are not biodegradable and have been deleterious for the environment. The recent public ban of Styrofoam by the government has created an opportunity to help resolve the issue

of environmental damage caused by improper disposal of waste coming from these packages which are not biodegradable, especially in light of the biodegradable containers that are on the market. The current takeaway containers on the market are mainly made from trees, which is not sustainable from the standpoint that they act as a carbon sink and when they are harvested more greenhouse gases are pumped into the atmosphere, thereby exacerbating climate change. However, bamboo holds great potential as a suitable sustainable alternative to trees. This woody-like plant's rate of replenishment is remarkable and it has very strong fibres making it suitable for manufacturing of takeaway containers. This research aims at use of bamboo to make a composite disposable eco-friendly takeaway container using food-grade bonding agents. Furthermore, this research aims at determining consumers' perception and attitude towards such a product. Ultimately, the research endeavours, based on the findings from this research, to create a business plan for such an entrepreneurial venture.

Keywords: Bamboo, sustainability, biodegradable containers.

3. Hall, K., & Linton-Shields, S. (2020). The utilisation of sargassum as a bio-fertiliser. Master of Science in Sustainable Energy & Climate Change Research Project.

Abstract: The invasive brown algae; *Sargassum fluitans* and *natans* are rapidly becoming an environmental issue to Caribbean countries. Since 2011, Sargassum has inundated the shorelines of Caribbean countries like Jamaica, negatively impacting economies, livelihoods, habitats, and the general marine environment. Several researchers have revealed that this phenomenon is because of oceanic anomalies brought about by climate change. A few Caribbean countries have embarked on developing sustainable initiatives to address the negative impacts of the Sargassum invasion. However, in Jamaica the algae is only removed from the shoreline and buried. The current study looks at the possibility of processing Sargassum algae to make liquid fertilisers as a sustainable initiative aimed at protecting coastal habitats and the livelihood of businesses which depend on the marine environment to generate income. The utility of the seaweed biomass as a fertilizer for plant growth has been renowned for centuries in Asia. In Jamaica the study of replicating this potential entails a series of tests and experiments to achieve the most suitable concentrate of liquid Sargassum extract for agriculture production. The market potential of the finalized product was also assessed among 300 farmers in the parish of Clarendon through a pre-research and experiment survey. During field testing an analysis of these activities showed that Sargassum contains the nutrients such as nitrate and phosphate that are necessary for plant growth and is most effective if administered at 25% of the concentrate. Some thirty-six plants were used in the two main phases of the experiment and were conducted over a nine-week period. It was concluded that the processing of Sargassum brown algae into liquid fertilizer is sustainable, promotes plant growth and provides an initiative for Jamaica to manage the impact of Sargassum in a meaningful and sustainable manner whilst providing a climate smart alternative for agriculture.

Keywords: Bio-fertiliser, Sargassum, sea weed, climate smart agriculture.

4. Little, T. (2023). Mainstreaming disaster risk management and climate change adaptation into development planning: An assessment of three local sustainable development plans in Jamaica. Master of Science in Built Environment Research Project.

Abstract: Ensuring that matters related to disaster risk management and climate change adaptation are adequately addressed in subnational development plans for small island developing states is a great undertaking. The inclusion of these key concepts has now become almost mandatory considering the impact of a changing climate and the manifestation of increasing disaster risk, which are hindrances to sustainable development. Against this background, this study assessed three of the five completed local sustainable development plans in Jamaica authored by the St. Catherine, Clarendon, and Trelawny Municipal Corporations regarding their approach to disaster risk management and climate change adaptation. The assessment included examining the approach of each Municipal Corporation to include disaster risk management and climate change as key concepts in development planning, analysing the alignment of disaster risk management and climate change adaptation within the plans against prevailing international frameworks, determining how best each Municipal Corporation achieved mainstreaming of the concepts in their respective plans and finally presented recommendations on how to improve any mainstreaming gaps identified. This study utilized a qualitative approach where interviews, content, descriptive and thematic analysis were crucial in uncovering findings and providing the necessary in-depth critique to satisfy the research questions. The main findings of the study indicate that each LSDP assessed made a noticeable effort to include matters relating to disaster risk management and climate change adaptation. In relation to framework alignment for the LSDPs there was mixed results, which indicated possible misalignment of the plans to the prevailing conceptual frameworks and finally it was determined that the concepts needed greater integration in the plans to achieve holistic mainstreaming. These results will provide insights to policymakers and future researchers on the challenges and opportunities influencing the systemic mainstreaming of disaster risk management and climate change adaptation as crucial elements of the development process.

Keywords: Disaster risk management, development planning, climate change adaptation.

5. Davis, J. L. (2020). Exploring the development of environmental literacy of construction students through the greening of the curriculum to facilitate sustainable construction. Master of Science in Built Environment Research Project.

Abstract: The construction sector in Jamaica has been experiencing rapid growth, particularly over the past decade. Of note, the natural environment and sustainable development are threatened by growing construction activities. Additionally, it is presented that students in the construction field must be taught sustainable construction practices to implement change. This can be done by greening the current curriculum to facilitate better environmental literacy. However, there is seemingly a gap in the existing curriculum pertaining to sustainable construction. Therefore, this study

aimed to develop the environmental literacy of construction students by exploring gaps in the existing University of Technology's Construction Management curriculum and proposing recommendations for the greening of curriculum to facilitate sustainable construction practices. Moreover, the objectives were to investigate the present curriculum with respect to sustaining the environment, evaluate the stakeholders' perspective of sustainable construction in Jamaica to identify principles for the greening of curricula, explore ways in which sustainable construction curricula could be developed and implemented, and ascertain the perception of the level of importance placed on the protection of the environment from degradation caused by the design and construction of civil structures. Data was collected from the University of Technology, Jamaica Diploma in Construction Management students and relevant stakeholders via questionnaires, in addition to document reviews. It was found that both students and stakeholders view the current curriculum as inadequate relating to environmental literacy. Also, this study found that implementing an updated, green curriculum requires a collaborative effort from all community stakeholders and that the delivery should be done by environmentally educated personnel. The implications of these findings may lead to achieving more sustainable construction practices in Jamaica.

Keywords: Environmental literacy, sustainable construction, curriculum development.

6. Lindsay, A.O. (2023). Drivers of sustainability that can influence resilient sustainable architecture in a Small Island Developing State (SIDS): A case from Jamaica. Master of Architecture Research Project.

Abstract: Given the global climate emergency and the thrust to attain sustainability, countless literature has been produced from developed or developing economies to guide national decisions. Furthermore, it has been widely accepted in the literature that a balance of 3 or more pillars primarily, social, environmental, and economic are needed to achieve sustainability. Despite this, however, sustainability is often viewed as a measure of disparate environmental or economic imperatives. Comparatively few academic works exist for SIDS on what are the underlying variables thar constitute each sustainability pillar. Moreover, even less research work in architecture for small economies such as Jamaica exists to guide the attainment of a resilient sustainable architecture framework. This study aimed to establish that a balance of social, economic, environmental, and other potential pillars is critical to attaining sustainability in Jamaica. To achieve this, a literature study was conducted to define sustainability and sustainable architecture, as well as to establish the theoretical framework and research discourse on sustainability. A qualitative sampling of (12) appraised textbooks in the field of architecture was screened to provide context-specific factors for sustainable architecture through content analysis. Quantitative data were obtained from secondary data published for Jamaica from local and international statistical reports, global development indicators, and SDGs scorecards. A 20-year panel dataset was built from 2000-2019, and the results were analyzed using a multivariate regression model. The findings revealed that a quadruple sustainability pillar, consisting of social,

environmental, economic, and project management/administration, is needed for Jamaica to attain sustainability. Affordable housing income and solar thermal were the most significant factors impacting resilient sustainable architecture. A residual list of (15) other interconnected factors, indicating that a balance of all four pillars is needed. In conclusion, the results show that if architects, engineers, project managers, academics, policymakers, and the government want to achieve a robust sustainable framework, the lives of marginalized groups must be positively impacted with quality and affordable housing. Solutions should be innovative, incorporating passive design principles and harnessing solar power to offset energy requirements. This research highlights the need for further architectural research in this uncharted domain. Furthermore, empowering the masses to adopt a sustainable approach and thinking will not only reduce the current burdens and anxieties surrounding water and other present needs, but will preserve resources for future generations.

Keywords: SIDs, sustainability, climate resilient architecture, SDGs.

7. Gordon, D. R. (2022). Affordable housing: Exploring the use of low-cost, climate-resilient, alternative building materials/systems as a strategy for improving housing affordability. Master of Science in Integrated Rural Management Research Project.

Abstract: This study assesses the use of Insulated Concrete Form (ICF), Insulated Concrete Panel (ICP), and EZ-Block (Aerated Concrete) systems as components for improving housing affordability. The assessment focused on the construction cost reduction offered from the use of existing alternative building materials/systems approved by the Bureau of Standards Jamaica (BSJ) compared to the construction costs of traditional materials/systems, relative to the maximum accessible financing offered to individuals at the National Housing Trust's (NHT's) low-to-middle-income bands. Additionally, the barriers and enablers to the use of alternative building materials/systems were interrogated via a thematic analysis of the responses of semi-structured interviews with housing professionals in the policy development, housing financing, approval and regulation, and material supplier subsectors. The research suggests that the materials/systems identified, although unable to deliver an average unit to individuals at the lowest income band, based on the construction cost to maximum accessible mortgage ratios offered the best option for delivering affordable units. However, a cultural preference for traditional materials was identified by industry professionals as the main barrier to their use, while the existing mechanism established by the BSJ for introducing new building materials/systems was the main enabler.

Keywords: Affordable, Alternative building materials/systems; Climate-resilience; Low-cost housing.

8. Chevannes, X. (2019). Factors affecting the life span of coastline roads in eastern Jamaica. Master of Science in Built Environment Research Project.

Abstract: Small Island Developing States (SIDS), particularly those situated in the Caribbean Region, owing to their size and geographic location, are predisposed to hydro meteorological hazards and sea level rise. Hence, this increases the level of

vulnerability of coastline roads to the effects of climate change. Jamaica is one such small island state. The eastern parishes; Saint Mary, Kingston and Saint Andrew, Saint Thomas and Portland have coastline roads, which have been significantly impacted. This paper aims at examining the effects of sea level rise and hydro meteorological hazards and how they impact the coastline roads. This research was conducted to ascertain the drainage infrastructure associated with these roads and how they impact their life span. Coming out of the study was the theoretical framework asserted on the Bruun Rule theory, which speaks to shoreline erosion in relation to increases in sea level. Further the study employed a qualitative design which included purposive sampling in gathering the data by interviewing the technocrats of the National Works Agency. The study revealed that sea level rise and the impact of tropical cyclones have been the main contributing factor to damages sustained on coastline roads. The interviews highlighted best practices used by technocrats in addressing issues related to coastline roads.

Keywords: Sea level rise, Hydrometeorological hazards

Academic Units Involved in Climate Change Research

Staff members and graduate students from six (75%) of the University's eight academic units were involved in research and scholarly activities on climate change (Table 2).

Table 2: Academic units undertaking climate change research

Academic Unit	Count
College of Business & Management	6
College of Health Sciences	2
Joint Colleges of Medicine, Oral Health & Veterinary Sciences	2
Faculty of Engineering & Computing	3
Faculty of the Built Environment	20
Faculty of Science & Sport	1
Total	34

Staff vs. Students Research

Of the total number of 'hits' of research and scholarly activities on climate, the number produced by staff members compared with students is shown in Table 3.

Table 3: Climate change research producers

Research Producer	Count
Staff	26
Student	8
Total	34

DISCUSSION

'Climate change' denotes the long-term modifications in the Earth's climate, particularly major alterations in its temperature, rainfall, and weather patterns. The major contributor to climate change in the modern era is global warming, which results from anthropogenic sources (human activities) that increase the concentration of greenhouse gases in the atmosphere, leading to the trapping of heat. There is an inextricable interdependence of climate, ecosystems and biodiversity, and human societies (IPPC, 2023).

PUBLICATIONS ON CLIMATE CHANGE

Concerning publications on climate change, the 15 publications and conference presentations by UTech, Jamaica's staff members that are curated in this paper reflect dissemination of climate change information to wider audiences beyond the walls of the institution. Scientific publications are crucial for the advancement of knowledge, as they enable researchers to share findings, validate results through peer review, and build upon previous work. They serve as a means of communication within the scientific community, fostering collaboration (Day & Gastel, 2012).

Notably, among the suite of support services provided to faculty members through the university's research development fund, which is managed by its research managers, is funding for publications to offset article processing fees; a financial incentive is also paid directly to faculty members who publish their research in peer-reviewed journals.

CURRICULUM DEVELOPMENT & CAPACITY BUILDING

As regards climate change related curriculum and capacity building activities at UTech, Jamaica, Toombs & Tierney (1993) highlight the central role of the curriculum in education as a catalyst for change, emphasizing context, content, and form as key components. Walter et al. (2023a, 2023b) note that developing curricula related to climate change is among the several ways Higher Education Institutions (HEIs) can contribute to climate action. UTech, Jamaica's Master of Science in Sustainable Energy and Climate Change (MSECC) reflects this by preparing graduates with the skills and knowledge for green business and climate policy. Alumni work in government, environmental regulation, meteorology, green entrepreneurship (solar energy), and one was elected as a Member of Parliament. The development of this Master's programme involved collaboration, partnership, and support from international organizations

(Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the CARICOM Energy Unit). These collaborations were anchored in agreements that the University's research managers assisted with finalizing and monitoring.

The Commonwealth of Learning (COL) recognizes open and distance learning (ODL) as a powerful tool for expanding access to quality education, especially in developing countries (Commonwealth of Learning, 2025). The bespoke *Tailored Open Online Course (TOOC) on Building Climate-Resilient Cities* demonstrated UTech, Jamaica's regional impact by expanding its reach beyond its geographical borders; the course equipped Eastern Caribbean participants with urban planning strategies to mitigate climate risks. The course incorporated cutting-edge knowledge and was customized to the region's diverse topography, hazards, population densities, and urban geographies. The participation of students from the University's Master of Science in Built Environment enabled them to interact with professional practitioners working in the field. In addition, notably, the development and delivery of this bespoke MOOC involved collaboration and partnership with organizations (Agence Française de Développement [AFD] and Organization of Eastern Caribbean States [OECS]) that were anchored in agreements that, as a part of their functions, the University's research managers assisted with finalizing and monitoring.

Additionally, the design by UTech, Jamaica of a National Training Programme on Carbon and Greenhouse Accounting and Capacity Development in Transparency of Accounting at the request of the Government of Jamaica was a first for the country and put the country in a position to earn carbon credits. This is impactful. According to the United Nations Framework Convention on Climate Change Carbon (2025), carbon credits refer to permits that enable holders to emit a set amount of carbon dioxide or other greenhouse gases (GHGs). One carbon credit is equivalent to one metric ton of carbon dioxide or an equal quantity of other GHGs. The objective of carbon credits is to decrease global carbon emissions by incentivizing companies and organizations to limit their emissions or invest in projects that reduce carbon emissions, such as renewable energy, reforestation, or energy efficiency. Carbon credits can be traded under a cap-and-trade system, whereby governments or regulatory bodies set an overall emissions limit (the cap) and distribute or auction off credits to companies. If a company emits less than its allocated quota, it can sell its excess credits. If it exceeds its quota, it must purchase additional credits from others. This creates a market for carbon credits and incentivizes businesses to lower their emissions. By global standards, Jamaica is not a significant emitter of carbon dioxide or other GHGs. Therefore, being able to accurately account for its level of emission, will put it in a position to sell carbon credits. This underscores the importance of the National Training Programme on Carbon and Greenhouse Accounting and Capacity Development in Transparency of Accounting undertaken by UTech, Jamaica in partnership with the Jamaican Government.

The design and delivery of this national training programme was based on an agreement with the Government of Jamaica that, in keeping with their role, the University's research managers assisted with finalizing and monitoring.

Research Projects

Pertaining to the *Climate Change Vulnerability Assessment* research project, it was significant in that it involved a rural community that relied on agriculture for its livelihood. Here we see UTech, Jamaica paying attention to Jamaica's agriculture sector, which contributes approximately 6% to the country's Gross Domestic Product (Economic and Social Survey of Jamaica, 2024). In addition, the agriculture industry is particularly vulnerable to adverse impacts of climate change.

As regards the *Application of Solar-Powered Polymer Electrolyte Membrane (PEM) Electrolysers for the Sustainable Production of Hydrogen Gas as Fuel for Domestic Cooking* research project, it was particularly ambitious having regard to its potential positive impact on Jamaica's energy security. The successful implementation of this research project consisted of six key areas that were investigated: power characterisation of the photo-voltaic system, colouring the flame of the burning hydrogen gas to make it visible, odourising the hydrogen gas as a safety measure in case of leakage, prevention of gas flame blow-back, gas storage, and gas stove modifications. Notably, in keeping with key research management functions articulated by Research Africa (2013), the University's research managers played integral roles in all pre- and post-award aspects of this project, which is, to date, the largest external research grant the institution has won.

Service Scholarship

In relation to 'service scholarship' (a coinage by UTech, Jamaica's research managers for this category of scholarly output) the six instances in which climate change was featured are consistent with the tripartite pillars of teaching, research, and service of universities, including UTech, Jamaica. Three of the six instances were newspaper articles in Jamaica's two major national papers that enjoy wide readership. Within the context of a university, one critical aspect of service undertaken by faculty is community engagement through knowledge sharing to build awareness among selected stakeholders. Boyer (1990) included service as an important component of academic life, underscoring its role in societal engagement. The University's research managers encourage faculty members to share their work in this way.

Graduate Students' Research

With respect to graduate students' research on climate change, the issues researched are critical challenges facing Jamaica (and other SIDs). In addition, all eight projects curated in this paper were done by students pursuing the following programmes in the Faculty of the Built Environment: Master of Architecture (2); Master of Science in Sustainable Energy and Climate Change (2); Master of Science in the Built Environment (3); and Master of Science in Integrated Rural Development (1). Undeniably, because of these relevant programmes, this faculty is preparing graduates for solutioning the adverse impacts of climate change through research-derived interventions. Notably, as is typical in universities, the graduate students' research work was carried out under the

supervision of faculty members. The University's research managers provided support to these supervisors through the preparation of a manual and the hosting of capacity building sessions.

Academic Units

A look at the academic units at the University that are undertaking research on climate change show that six of the eight (75%) academic units are involved (Table 2). Unsurprisingly, the *Faculty of the Built Environment* emerged as the 'champion' accounting for more than half (59%) of the total output. That the majority of UTech, Jamaica's academic units is engaging in research on climate change underscores the multidisciplinarity that is necessary to address its adverse impacts. A multidisciplinary approach is critical for addressing the adverse impacts of climate change. This is because this approach integrates multiple perspectives and expertise, leading to more comprehensive and effective solutions (IPCC, 2022).

Conclusion & Recommendations

Higher Education Institutions (HEIs) must play a critical role in the fight against climate change through education, research, and service. They educate future leaders and professionals about sustainability, equipping them with knowledge to address environmental challenges. HEIs also conduct relevant research on climate science, renewable energy, and sustainable practices, thereby providing data-driven solutions to mitigate the adverse impacts of climate change (Walter et al., 2023a, 2023b; Katrina et al., 2018).

This paper provides strong evidence that the University of Technology, Jamaica is contributing significantly to understanding climate change and addressing its adverse impacts through education, curriculum development, research, and service. The research and scholarly output undertaken by staff and students, with critical support from its research managers, highlight the institution's role in advancing solutions for Jamaica and other Small Island Developing States (SIDS).

UTech, Jamaica's approach to addressing climate change holds lessons for other universities, which should consider the following recommendations:

1. Integrating climate science into their curricula, emphasizing an interdisciplinary approach.
2. Strengthening their research and innovation management ecosystem.
3. Encouraging and supporting faculty members and students to pursue research that provides data-driven solutions to the adverse impacts of climate change, at the local and global levels.
4. Pursuing collaborations and partnerships with government agencies, international climate organizations, and other entities to fund and support climate change research.
5. Ensuring dissemination of climate change research undertaken by faculty members and students.

6. Developing climate change awareness outreach initiatives and engaging members of the public, policymakers, private sector, and other stakeholders.

This paper also provides insights for the research management office at UTech, Jamaica, and for the research management profession generally. Considering Jamaica's vulnerability to the adverse impacts of climate change, the institution's research managers will consider implementing the following strategies, going forward:

1. Earmarking a portion of the Research Development Fund exclusively to research that builds resilience, through novel adaptation and mitigation measures, in key sectors of the Jamaican economy (e.g. agriculture and tourism) to the adverse impacts of climate change, and issue internal Calls for Proposals.
2. Encouraging and facilitating cross-faculty collaboration among the University's eight academic units through the formation of research groups emphasising climate resilience, renewable energy, and sustainable development research projects.
3. Providing greater support for students to engage in climate change research and other related activities, such as innovation competitions.
4. Pursuing joint research projects with other universities, especially those in other SIDS with similar vulnerabilities and climate-induced challenges.
5. Publishing a special climate change issue of the University's peer-reviewed journal (the Journal of Arts Science and Technology) to further increase the visibility of this research output.

By implementing these initiatives, UTech, Jamaica's research management office will further strengthen the institution's contribution to climate change solutions and its impact at the national, regional, and global levels. However, to effectively ramp up its support, it will be necessary for the research managers to build their capacity through upskilling in the following specific areas:

1. Best practices for fostering and managing interdisciplinary collaboration among academic units and other universities.
2. Training about national and international climate policies. For example, the Paris Agreement and Jamaica's Climate Change Policy Framework.
3. Institutional research data management and analysis, including visualization techniques for presenting climate research results more effectively.
4. Impact assessment and best practices for tracking outcomes of climate adaptation and mitigation research projects undertaken by faculty and students.

Building the capacity of research managers at UTech, Jamaica in these areas will strengthen the University's research management office, enabling it to better support faculty and students and, in turn, increase its impact on climate science research.

In sum, this paper highlights the University of Technology, Jamaica's commitment to climate action through research to mitigate climate change impacts on Small Island Developing States (SIDS). It underscores the pivotal role of higher education institutions and research managers in advancing climate research, managing research information,

and disseminating findings. Additionally, it offers recommendations for other universities and outlines future initiatives by UTech, Jamaica, to enhance climate resilience and research capacity.

REFERENCES

Association of Commonwealth Universities (2006). International research management: Benchmarking programme report to the Higher Education Funding Council for England (HEFCE), UK. Association of Commonwealth Universities. https://dera.ioe.ac.uk/id/eprint/6203/1/rd11_06.pdf

Betzold, C. (2015). Adapting to climate change in small island developing states. *Climatic Change, 133*, 481–489. https://doi.org/10.1007/s10584-015-1408-0

Booth, A., Sutton, A., & Papaioannou, D. (2016). Systematic approaches to a successful literature review. SAGE Publications.

Boyer, E. L. (1990). Scholarship reconsidered: Priorities of the professoriate. The Carnegie Foundation for the Advancement of Teaching.

Commonwealth of Learning (2025). https://www.col.org/.

Day, R. A., & Gastel, B. (2012). How to write and publish a scientific paper (7th ed.). Cambridge University Press.

Dunkley-Willis, A. (2024, October 18). Solar solution. *Jamaica Observer.* https://www.jamaicaobserver.com/2024/10/18/solar-solution/

Economic and Social Survey of Jamaica (2024). Planning Institute of Jamaica.

Government of Jamaica (2023). Climate change policy framework for Jamaica.

Han, J., Kamber, M., & Pei, J. (2011). Data Mining: concepts and techniques (3rd ed.). Morgan Kaufmann.

IPCC (Intergovernmental Panel on Climate Change) (2022). Climate change 2022: Impacts, adaptation, and vulnerability. Cambridge University Press.

IPCC (Intergovernmental Panel on Climate Change) (2023). Climate change 2023: Synthesis report. IPCC. https://doi.org/10.59327/IPCC/AR6-9789291691647.001

Ivey, P., Streete, T., Henry, M. & Oliver, G. (2012). Evaluating the research performance of an emergent technological university. *Global Journal of Engineering Education, 14(1), 132–136*.

Ivey, P., Potopsingh, R., Henry, M. & Oliver, G. (2013). Structured research management in action: A review of recent experiences at the University of Technology, Jamaica. *Journal of Arts Science and Technology, 6, 74–82*.

Ivey, P. & Potopsingh, R. (2023). Globalization: Embracing 'borderlessness' to build institutional research capacity and enhance curriculum development at Jamaica's leading public university. *Journal of Arts Science and Technology, 15(3), 123-138.*

Katriina, S., Alexandra J., Janna P. & Kaisa K-K. (2018). Universities responding to the call for sustainability: A typology of sustainability centres. *Journal of Cleaner Production, Volume 170, 2018, 1423-1432.*

Lemann, N. (2014). The Soul of the Research University. The Chronicle of Higher Education, April 28, 2014.

Ministry of Energy and Mining (2009). Jamaica's energy policy 2009-2030. Author.

Ministry of Labour and Social Security (2015). Labour market trends and prospects for employment opportunities. Author. https://lmis.gov.jm/sites/default/files/2021-09/Labour-market-trends-2015.pdf

Onyefulu, C. C., & Ogunrinade, A. F. (2005). Kick-Starting research in newly emergent universities: Why faculty do not apply for research development "SEED" funding at the University of Technology, Jamaica. *Journal of Research Administration, 36(2).*

Organization for Economic Cooperation and Development (OECD) (2004). University Research Management: Meeting the institutional challenge. OECD-library.org.

Parliament of Jamaica (1999). University of Technology, Jamaica Act. https://laws.moj.gov.jm/library/statute/the-university-of-technology-jamaica-act/download

Planning Institute of Jamaica. (2010). Vision 2030, Jamaica: national development plan: popular version.

Potopsingh, R. (2015, November 19). Climate action and green competitiveness: Scaling green business and industry [Conference presentation]. *World Bank*.

Potopsingh, R., & Alcock, O. (2022). Policy recommendations for cleaner and more efficient transport fuels and vehicles for Jamaica. *Journal of Arts Science and Technology*, 14(1), 24–42.

Rademaekers, K., Yearwood, J., Ruuds, B. & Razdan, A. (2014). *BRIDGE in sustainable energy and information and communication technologies—Project ID: RG-T2373 Inter-American Development Bank Component 1: Technical and professional capacity baseline analysis sustainable energy final report.* https://www.iadb.org/en/project/RG-T2373

Research Africa (2013). *A research manager's notebook (Part 1): Being a research manager: Understanding your role and maximising your impact.* Research Africa.

Toombs, W.E. & Tierney, W.G. (1993). Curriculum definitions and reference points. *Journal of Curriculum and Supervision, 8 (3):175-195.*

United Nations Development Programme (2024). Small island developing states are on the frontlines of climate change – Here's why. *UNDP Climate Promise.* https://climatepromise.undp.org/

United Nations Framework Convention on Climate Change Carbon (2025). United Nations.

UTech, Jamaica (2009). Research policy, 2009.

UTech, Jamaica (2021). Strategic plan, 2021–2025.

Walter, L. F., Yusuf A. A., Maria, A. P. D., Wendy, P. & Gustvo, J. N. (2023a). Climate change: Why higher education matters? *Science of The Total Environment, Volume 892, 2023,164819.*

Walter, L. F., Sebastian, W., Johannes, M. L., Javier, S., Izabela, S. R., Ayyoob, S., Rosley, A., Joao, H.P. P. E. & Marina, K. (2023b). Towards a greater engagement of universities in addressing climate change challenges. *Sci Rep 13, 19030 (2023).*

World Bank (2024). Climate change knowledge portal for development practitioners and policymakers. https://climateknowledgeportal.worldbank.org/country/jamaica

World Commission on Environment and Development (1987). Our common future (Brundtland Report). https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

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Paul W. Ivey, who has more than 30 years' experience as an educator and higher education administrator, is an Associate Professor and the Associate Vice President for Graduate Studies, Research & Entrepreneurship at the University of Technology, Jamaica. His responsibilities include ensuring that the University's suite of postgraduate courses is relevant and reflects the requisite standards; developing policies, guiding, and supporting the institution's research activities, focusing on interdisciplinary, applied research that addresses local and global societal challenges; promoting and overseeing consultancy and entrepreneurial activities; protection and commercialization of intellectual property; he is also editor-in-chief of the University's flagship peer-reviewed journal, the Journal of Arts Science and Technology.

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