

Sustainability in the University Setting and Applications at the Universidad Tecnológica de Panamá

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Abstract

This paper provides context on the 2018 UTP MQP by describing the history of sustainability in higher education and tools that universities use to quantify their environmental impact and compare themselves to universities worldwide. The STARS and GreenMetric ranking systems are highlighted. Sustainability efforts of American University, WPI, and Wageningen University are outlined to illustrate various approaches to reduce emissions and incorporate sustainability into academics and research. This global comparison allows both UTP and WPI to find new sustainability insights.

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1. Foreword

This is a supplemental section to the civil engineering Major Qualifying Project (MQP) conducted in A term of 2018 at the Universidad Tecnologica de Panama (UTP). The previous work included two civil engineering design components: a greywater recycling system for the Engineering Building and a stormwater management design guide. It also included recommendations for UTP to conduct a more thorough campus sustainability inventory, increase the visibility and efficiency of the Office of Sustainability, and develop an official Climate Action Plan. The current work provides additional context to these recommendations by reviewing the sustainable practices and Office of Sustainability operations of highly-ranked sustainable universities worldwide, including American University and Worcester Polytechnic Institute in the United States and Wageningen University in the Netherlands. It also illustrates the benefits of participating in global and regional networks to develop sustainability-related curricula. It concludes with recommendations for both UTP and WPI to become more sustainable institutions that combine best practices from universities worldwide.

2. Background

The environment has always played a role in both formal and informal education. Early on, this involved the functional knowledge required for rural life or abstract learning about the natural sciences, without much connection to the relationship between society and the environment. In later decades, economic concerns sparked the incorporation of land and resource conservation into environmental education.¹ Around 1970, new approaches to the problems of the environment were

¹UNESCO, [*Environmental education in light of the Tbilisi Conference*](#) (Paris: United Nations, 1980), 20.

developed. These approaches recognized that while the natural sciences are important, “socio-cultural and economic dimensions define, for their part, [conceptual instruments] that enable man to understand and make better use of the resources of the biosphere in satisfying his needs”.²

This new conception of the context of environmental concerns was reflected in the **Tbilisi Declaration** in October of 1977. This declaration was the result of the first intergovernmental conference on environmental education, held in Tbilisi, Georgia by the United Nations Educational, Scientific and Cultural Organization in collaboration with the United Nations Education Program. Over 300 delegates from member states and representatives from UN agencies developed guidelines for environmental education at all age levels and on a local, regional, and international scale. In the declaration, the goals of environmental education are to (1) foster awareness of the socioeconomic and ecological interdependence present in both rural and urban areas; (2) provide equal opportunity to acquire the knowledge, skills, and attitude needed to protect the environment; and (3) create new patterns of behavior for individuals, groups, and societies as a whole. The Tbilisi Declaration also clarified that environmental education should accommodate all ages and socio-professional groups in the population. This includes nonspecialist members of the population, whose daily actions have an impact on the environment, as well as social groups whose professional activities influence the quality of the environment and scientists and technicians whose specialized work “[lays] the foundations of knowledge on which education, training, and efficient management of the environment should be based”.³ These guidelines are essential to

² UNESCO, [Environmental education in light of the Tbilisi Conference](#) 21.

³ Global Development Research Center, [“Tbilisi Declaration \(1977\)”](#).

ensuring environmental education's effectiveness in promoting the improvement and protection of the environment.

In the university setting, commitment to the environment has evolved beyond just academic offerings as climate change has become an urgent concern. Reducing carbon emissions is now an increasingly common goal, with many universities striving for carbon neutrality, or producing zero net emissions. In general, carbon neutrality is achieved through a combination of mitigation efforts that reduce emissions and financial choices that are geared toward sustainability. Mitigation efforts may include transitioning to renewable energy, replacing diesel buses with a biofuel-powered fleet, or purchasing carbon credits to offset emissions. Additionally, universities may plan adaptation strategies to combat and adapt to the changes to the climate that are already set in motion, such as sea level rise or increased regional drought.⁴ These typically take the form of a stormwater management plan, upgrading to water-efficient appliances, or implementing water recycling methods. Together, these strategies are typically summarized in a university's climate action plan (CAP) or sustainability plan, which are popular tools used by universities to track progress and frame student engagement in sustainability efforts.

The 2018 MQP completed with UTP focused on both mitigation and adaptation strategies. Since Panama is vulnerable to both increased risk of drought and increased extreme weather events according to climate change models, the recommended adaptation strategies were two-pronged. The stormwater management design guide was developed to assist UTP in reducing the risk of flood damage in the event of extreme weather events. The greywater recycling system was

⁴ University of Louisville Sustainability, ["Climate Action Plan"](#)
Boston University, ["Recommendations Of The Climate Action Task Force For Boston University's Climate Action Plan"](#)

designed to reduce water consumption in the Engineering building, which will be essential if Panama experiences increased drought in the coming years. Section 3.3 in the A term MQP contains detailed information on the design and benefits of each of these components. Additional recommendations for a future Climate Action Plan included transitioning to water and energy-efficient appliances across campus and implementing more public transportation options for student and faculty commuters. These changes would reduce both resource consumption and UTP's carbon emissions.

3. Measuring Sustainability

Several worldwide ranking systems exist to compare universities in terms of sustainability practices and greenhouse gas emissions. The two major ranking systems are STARS, which is widely used in the United States and other developed nations, and the GreenMetric, which was developed in part to cater to developing nations who may be intimidated by existing, well-established ranking systems.

The **Sustainability Tracking, Assessment, and Rating System (STARS)** was developed by the Association for the Advancement of Sustainability in Higher Education (AASHE), which was established in 2005 to coordinate and strengthen campus sustainability efforts at a regional and national level in the United States. The STARS system has four categories which evaluate different aspects of sustainability.

- *Academics* measures the institution's promotion of sustainability literacy across its academic offerings.
- *Engagement* measures how the university advocates for sustainability in both the campus and broader community, as well as how representatives of the university

participate in policy discussions on various stakeholder levels that may impact sustainability practices.

- *Operations* refers to the emissions and resource consumption necessary to maintain the air and climate, buildings, dining services, energy needs, transportation services, water, and waste disposal of campus. Carbon neutrality efforts can lead to significant gains in this category.
- *Planning and Administration* gauges if the university navigates coordination, planning, diversity and affordability, and investment with sustainability principles in mind.

In 2018, **American University** in Washington D.C. became the first carbon neutral university in the United States, earning 73.94 points for a Gold rating and fourth-place spot in the STARS scoring system.⁵ The University earned more than 95% of available points for the subcategories of *Coordination & Planning* and *Water*. Total water use on campus fell by 21% from the baseline year of 2011 to 2018, while the university's focus on engaging both students and faculty in university governance earned them a high rating in *Coordination & Planning*. The university earned the smallest percentage of available points in the subcategory of *Food & Dining*. This is due to the university deciding not to pursue the Food and Beverage Purchasing credit, which is worth 6 points. Even as the first carbon neutral university in the U.S., American University has several areas for improvement in regards to sustainability.

Worcester Polytechnic Institute (WPI) self-reported to the STARS system in 2017, receiving a Gold ranking with a total score of 65.01 points. WPI earned around 90% of available

⁵ AASHE, "[American University](#)"

points in each of the subcategories of *Campus Engagement* and *Research*. The university writes that they “[engage] students and employees in sustainability through an Eco-Reps program as well as an active Student Green Team”.⁶ These organizations contribute to WPI’s sustainability outreach programs, including the annual waste audit and dorm energy-use competitions. Additionally, nearly 87% of WPI’s academic departments are involved in sustainability-related research. This number does not include non-tenured and non-tenure-track faculty that may also be involved in sustainability-related research. WPI’s lowest-scoring subcategories were *Investment and Finance* and *Water*. The university did not pursue any points in the *Investment and Finance* subcategory, which evaluates if a university has a committee to advise on socially and environmentally conscious investment options, if the university’s investments have positive environmental impacts, and if the university makes information about its investment holdings publicly-available. STARS measures potable water use per campus user and per unit of floor area, while non-potable water use is measured per unit of vegetated grounds. At WPI, all three of these measures increased or remained the same since the baseline year of 2014, despite the installation of low-flow faucets and showers and toilet flushometers in some buildings across campus. This category may improve as WPI “[places] priority on water conservation appliances during building renovations”.⁷ The STARS scoring system and detailed subcategories serve as a guide for universities to prioritize their sustainability efforts.

Another ranking system called the **GreenMetric** was created by the University of Indonesia in 2010. It was developed to have a numerical scoring system, rather than the prevailing alphabetical ranking system available at the time via the US-based Green Report Card system, to

⁶ AASHE, [“Worcester Polytechnic Institute”](#)

⁷ AASHE, [“Worcester Polytechnic Institute | Water Use”](#)

allow for more informative comparison between universities. It has a total of 10,000 possible points, which are earned by a weighted average of six categories.

- *Energy and Climate Change* (21%) measures the university's energy consumption and greenhouse gas emissions.
- *Waste* (18%) evaluates how the university disposes of recycling, garbage, organic waste, and sewage.
- *Transportation* (18%) measures the emissions related to commuting to campus as well as campus transit systems.
- *Education* (18%) measures the availability of sustainability-related courses, literature, and events on campus.
- *Setting and Infrastructure* (15%) evaluates the size, layout, and infrastructure of the campus.
- *Water* (10%) measures water consumption and conservation practices on campus.⁸

Wageningen University in the Netherlands earned the highest GreenMetric score in 2018, outranking 718 other universities. Specific information on the points they earned and in which categories was not available on the GreenMetric website, but a university press release states that they earned the maximum possible points in *Waste*. *Transportation* was their lowest-scoring category.⁹

⁸ Dworak, M., MacLeod, T., Mears, N., Wernsing, G.. (2017). *Implementing Environmental Indexing and Monitoring at UTP*. (Undergraduate Interactive Qualifying Project No. E-project-101117-122452). Retrieved from Worcester Polytechnic Institute Electronic Projects Collection: <https://web.wpi.edu/Pubs/E-project/Available/E-project-101117-122452>

⁹ Koperdraat, Vincent. [“Wageningen - The World's Greenest University”](#), (December 15, 2017)

In 2016, the **Universidad Tecnológica de Panama** (UTP) self-reported to the GreenMetric system and earned 3,638 out of 10,000 points, ranking 365th out of 516 reporting universities in that year. The university earned the highest proportion of available points in the Setting and Infrastructure category, with 856 out of a possible 1,500 points. Water was the lowest-scoring category, with 155 out of a possible 1,000 points.¹⁰ Based on these results, the design component of the 2018 MQP prioritized reducing water consumption on campus with a greywater recycling system.

The STARS and GreenMetric ranking systems have **differing participation rates**, which may be influenced by differences in organization status and recognition practices. The STARS system is in use by 934 institutions in 38 countries. Highly rated universities are commonly featured in AASHE publications and social media, which reach over 900 AASHE member institutions in the US, Canada, and 20 countries.¹¹ The STARS website also includes recommendations and brand guidelines for universities to market their STARS seal as a recruitment tool online and in other publications. The broad audience and emphasis on marketing sustainability achievements may make the STARS system a more attractive option for universities that are looking to become known as a competitively sustainable institution. On the other hand, the GreenMetric system was used by 719 universities from 81 countries in 2018, which was a 16% increase from 2017. As a single university rather than a global network, the University of Indonesia relies on invitations to associations like the Association of Southeast Asian Institutes of Higher Learning (ASAIHL) and the Association of Pacific Rim Universities (APRU) to promote the GreenMetric. The GreenMetric website contains a ranked list of all participating universities,

¹⁰ Dworak, M., MacLeod, T., Mears, N., Wernsing, G.. (2017).

¹¹ AASHE, [“About STARS- The Sustainability Tracking, Assessment & Rating System”](#)

but there is no information on individual university total scores or by category. There are also no guidelines or visual materials provided for universities to market their GreenMetric scores.

Nonetheless, the University of Indonesia states that the GreenMetric plays an important role by including universities from developing nations “which might otherwise feel they would be at a disadvantage with the existing well-established systems”.¹²

4. Coordinating Sustainability Efforts

Many universities create **new offices to oversee and synthesize sustainability efforts** across campus. The Office of Sustainability at American University coordinates programs and publishes information about campus sustainability initiatives. Their aim is to promote a “culture of sustainability that is evident through faculty research efforts, student involvement, and staff practices”.¹³ The Office of Sustainability coordinates with the campus’s Center for Teaching, Research, and Learning to oversee the Green Teaching Certificate (GTC) through which “qualified courses are rewarded with a seal representing one of five levels of the GTC, which is listed on syllabi to market courses as green”.¹⁴ The Office publishes information on major campus sustainability achievements, which include reaching their goal of carbon neutrality two years ahead of schedule, transitioning to 100% renewable-energy-sourced electricity, and several carbon offsetting programs. They also oversee the university’s sustainability-related social media accounts, a sustainability newsletter, and a list of sustainability-related student organizations. In addition, the Office of Sustainability publishes the comprehensive American University Sustainability Plan and yearly greenhouse gas emission reports.

¹² University of Indonesia GreenMetric, [“Frequently Asked Questions”](#)

¹³ American University, [“Office of Sustainability”](#)

¹⁴ American University, [“Education and Research”](#)

WPI's Office of Sustainability coordinates sustainability efforts across the university's administrative, academic, and facilities groups. It is comprised of administrators, faculty, and student interns. The Office of Sustainability publishes an Annual Report that documents WPI's progress toward sustainability, research, and campus engagement goals. The Office oversees the EcoReps program, which is a group of student and faculty volunteers who host educational events and are available to answer questions regarding energy use, recycling, and waste reduction specific to respective buildings on campus. Within the Office, the Sustainability Advisory Committee helps WPI coordinate "campus-wide efforts in energy and resource conservation, economic security, and social well-being".¹⁵ The Office of Sustainability oversees the Green Revolving Fund (GRF), which was established in 2017 to support sustainability projects led by members of the WPI community. Savings generated by GRF-funded projects, such as through reduced electricity consumption, are returned to the fund to ensure its financial sustainability.¹⁶ While still in the early stages, the GRF has already supported projects that are estimated to save WPI \$270,000 in electricity reduction and other savings.

Wageningen University takes a different approach to the role of a sustainability office. Its Green Office is student-led, with support from Facility Services. Its aim is to connect Facility Services to education and research departments on campus and create opportunities for students to complete sustainability projects for internship or course credit. The Green Office also promotes information sharing for stakeholders in the field of sustainability on campus and beyond.¹⁷ They publish a calendar of ongoing initiatives on campus, including a secondhand bike sale, carpooling

¹⁵ Worcester Polytechnic Institute, ["Meet the Team- Sustainability"](#)

¹⁶ Worcester Polytechnic Institute, ["Proposals Sought for Green Revolving Fund's Community Initiative"](#) (September 11, 2018).

¹⁷ Wageningen University and Research, ["Green Office Wageningen"](#)

group, and sustainable agriculture information-sharing platform. They also maintain a sustainability blog and social media accounts.

5. Carbon Offsetting

American University uses **carbon offsets** to offset emissions associated with studying abroad and commuting to campus. Carbon offsetting is the practice of investing in industries or projects that reduce emissions such as renewable energy or reforestation. Since the “geographic source of GHG emissions is irrelevant to their climate change impact”, carbon offsets can be used to essentially erase an entity's own carbon emissions.¹⁸ Carbon offsetting can increase a university’s ranking in the STARS or GreenMetric ranking systems, since both systems assess a university’s net carbon emissions. American University partnered with the District of Columbia’s Department of Energy and Environment to plant 650 trees throughout the D.C. area to offset commuting-related emissions and provide stormwater management benefits to the area. In a press release, the university acknowledged that typically, carbon offsetting projects are located in distant areas. While these projects help reduce the global level of carbon emissions, they “typically offer no tangible benefit to the local community”.¹⁹ On the contrary, the D.C. tree-planting project reduces climate impacts of student and faculty commutes in a way that provides aesthetic and environmental benefits to the city.

The university also offsets emissions from the nearly 1,000 students who travel abroad for academic programs each year by supporting the purchase of cookstoves in Kenya, where the university has a study abroad site. These stoves burn wood more efficiently to reduce deforestation

¹⁸ Gillenwater, M., Broekhoff, D., Trexler, M., Hyman, J., and Fowler, R., [*Policing the Voluntary Carbon Market*](#). Nature Reports Climate Change, pages 85–87 (2007)

¹⁹ Alexander, Kelly. [“American University Launches Innovative Carbon Offset Program in Washington, D.C.”](#). (April 18, 2018)

for firewood while also improving indoor air quality. The cookstoves are produced by a company called the Paradigm Project, which sells carbon credits generated from the use of its stoves, solar-powered lights, and water filters in communities around the world. These sales allow them to maintain low product prices to support their mission of “achieving sustainable development outcomes alongside emission reductions”.²⁰

The Paradigm Project claims that its “rigorous monitoring and reporting” and “unequaled co-benefits” set them apart from other carbon offset options. However, their website does not include any monitoring reports or other publications on the emission reduction capabilities of their products. In 2011, a Norwegian classification, certification and technical assurance company called Stiftelsen Det Norske Veritas conducted a verification report for the Paradigm Project’s water filter and stove program in Kenya. This report states that the program was expected to reduce emissions by 1,351,221 tons of CO₂ equivalent over seven years, but more detailed or recent data was not publically available.²¹

Local carbon offsetting projects, like American University’s tree-planting initiative, are typically easier to monitor for accuracy of their emission reduction claims due to their geographic proximity to campus and the ability to develop working relationships with project administrators.²² Local projects also present the possibility of academic co-benefits, by allowing students to be engaged in the project process. **Therefore, local projects often allow a university to combine carbon emission reductions with educational and campus engagement goals,** which have

²⁰ The Paradigm Project, [“Our Impact”](#).

²¹ Stiftelsen Det Norske Veritas, [“About Stiftelsen”](#).

DNV Climate Change Services, [“Gold Standard Validation Report: Paradigm Project”](#), (2011).

²² Curtis, Lisa. Whitman College, [“Creating carbon offsets : a new alternative for colleges and universities?”](#), (Spring 2010).

become increasingly relevant as universities take a more holistic approach to promoting sustainability on their campuses. However, overseeing local projects requires more time and expertise than outsourcing carbon offsets to specialized carbon offsetting companies like the Paradigm Project.²³ Universities should assess these requirements and the accuracy of anticipated emissions reductions when deciding on implementing a local offsetting project or purchasing carbon offsets from a specialized company.

In any case, carbon offsets should be one of the last stages of a **‘carbon management hierarchy’**. They should only be used “when the options for avoiding, then reducing emissions, and then substituting lower carbon options have been exhausted”.²⁴ However, in a 2010 survey of 1,600 environmental management practitioners, 44% of respondents feared carbon offsets divert attention from reducing carbon emissions at their source.²⁵ Universities, in particular those with more financial capacity, should not simply resort to purchasing offsets to improve their carbon footprint before committing the time and resources required to reduce their own carbon emissions at the source.

6. Sustainability Education

After the Tbilisi conference, efforts began worldwide to incorporate its guidelines into curricula on all scales, particularly in higher education. In 2010, the United Nations Education Programme established the Global Universities Partnership on Environment for Sustainability (**GUPES**). This partnership seeks to make the incorporation of sustainability principles into

²³ Second Nature, [“Carbon Markets & Offsets Guidance”](#) (2016), 29.

²⁴ Hymans, K., and Fawcett, T., [“The ethics of carbon offsetting”](#) (January 28, 2013).

²⁵ Institute of Environmental Management and Assessment, [“Special Report – GHG Management & Reporting”](#) (2010).

university curricula in Latin America and the Caribbean, Africa, and the Asian-Pacific more cohesive, with an overarching goal of building “the professional capacity and leadership needed for the prevention of and responses to environmental issues”.²⁶ As of 2015, over 530 universities around the world participate in the GUPES partnership. Other Latin-America-specific networks have been developed to improve a country or region’s implementation of sustainability policies and environmental education training programs. The first of these networks, the Colombian Environmental Training Network, was created in 1982 and now, over 40 universities in Colombia actively participate in this network.²⁷ Other national partnerships were established in Mexico, Argentina, Brazil, and Chile. Several of these networks combined in 2007 to create the Alliance of Iberoamerican University Networks for Sustainability and the Environment, known as ARIUSA in Spanish. This alliance guides university sustainability research programs and develops training materials to improve sustainability education in Latin America.

In 2015, several universities in Panama created the Network of Panamanian Universities for Sustainable Development, known as **RUPADES** in Spanish. The goal of the network is to “promote environmental management in universities to meet the challenges of sustainable development in Panama”, while adhering to the guidelines established by GUPES and ARIUSA.²⁸ UTP was a founding member of RUPADES, alongside 19 other Panamanian universities. The network has a Board of Directors, comprised of rectors from participating universities, and an Inter-institutional Committee to guide the decision-making of the network and promote

²⁶ United Nations Environment, [“Global Universities Partnership on Environment for Sustainability”](#).

²⁷ Sáenz, O., and Benayas, J., [“Higher Education, Environment and Sustainability in Latin America and The Caribbean”](#).

²⁸ United Nations Environment, [“The Network of Panamanian Universities for Sustainable Development \(RUPADES\) is born”](#) (2015).

collaborative sustainability research.²⁹ The 2016-2020 Cooperative Framework for Development established for Panama by the United Nations cites providing support to RUPADES as a key approach to involving Panamanian academic institutions in the development of sustainability policies. In adherence with Panama's National Education Plan, the framework prioritizes adding sustainable development content to curricula, improving environmental management of water, energy, and waste systems, and strengthening research and social outreach.³⁰

In addition to the previously-discussed sustainable actions of American University, Wageningen University, and WPI, these institutions also have **extensive academic offerings related to sustainability**. At American University, the Office of Sustainability coordinates with the campus's Center for Teaching, Research, and Learning to oversee the Green Teaching Certificate (GTC) discussed previously, which markets courses related to sustainability with a GTC seal on syllabi and in course catalogs. The institution also created the Environmental Collaborative, or ECOllaborative, as a forum to promote faculty research and sustainability-related degree programs for undergraduate and graduate students.³¹ These degrees range from STEM-based, like Environmental Science, to business-oriented, like Nonprofit Management and Applied Microeconomics, and policy-oriented, like Global Environmental Policy and International and Comparative Environmental Law. Sustainability-related research spans from implications of environmental governance in the Brazilian Amazon to environmental stewardship practices in Japan. The ECOllaborative unites members of the American University community who apply their diverse perspectives to questions of environmental protection and social prosperity.

²⁹ RUPADES, [“Letter of Understanding”](#).

³⁰ United Nations Panama, [“Cooperative Framework for Development 2016-2020”](#)

³¹ American University, [“ECOllaborative”](#)

Wageningen University also has a variety of sustainability-related degree options for undergraduate and graduate students, although they are not currently grouped and promoted by an initiative like AU's ECOllaborative or GTC program. These include Forest and Nature Conservation, Environmental Science, and International Land and Water Management.³² The institution also has a variety of research areas related to sustainability. These include climate change, circular and bio-based economies, and metropolitan solutions. These research areas envelop topics such as repurposing agricultural byproducts, designing 'water-smart' cities, and evaluating how climate change impacts forest growth.³³

Worcester Polytechnic Institute offers a variety of academic courses and programs related to sustainability. There are currently 119 undergraduate courses and 30 graduate courses with material related to sustainability. WPI publishes a list of these courses on the Office of Sustainability website, but there are currently no specific sustainability designations for courses like at American University. In addition, WPI offers a minor in Sustainable Engineering and a major or minor in Environmental and Sustainability Studies.³⁴ Other academic programs, including Environmental Engineering, Civil Engineering, and Chemical Engineering, have applications to the environment and sustainability principles. In 2019, WPI is building a new vision for cross-cutting thematic areas in education, research, and outreach. Sustainability, specifically the food-energy-water nexus, will be one of these cross-cutting themes, with each core academic department including sustainability in coursework whenever possible. These thematic areas will inform how WPI fulfills its core institutional values of building community, fostering collaboration, and building strategic alliances.

³² Wageningen University and Research, ["Education & Programmes"](#).

³³ Wageningen University and Research, ["Research & Results"](#)

³⁴ Worcester Polytechnic Institute, ["Academics and Research | Sustainability"](#).

³⁵ WPI is also updating its Sustainability Plan in 2019. To seek input from both student and faculty stakeholders, the Office of Sustainability will be holding a World Cafe Input Meeting, in which small groups will discuss a topic area, guided by facilitators, to develop priorities, objectives, and action items for the next Sustainability Plan.³⁶ Based on their lowest-scoring STARS categories, WPI could improve its ranking by incorporating sustainable investments, such as carbon offsetting, and strategies for reducing water consumption into the Sustainability Plan.

7. Conclusions and Recommendations

Universities around the world have responded to the climate change crisis with strong commitments to sustainability principles in their actions, investments, and academics offerings. The sustainability movement across universities has exposed a generation to the importance of protecting the environment. While UTP has made important strides toward becoming a more sustainable institution by self-reporting to the GreenMetric and establishing priority areas, their sustainability goals would benefit from increased collaboration amongst groups and departments on campus, as recommended by the A term MQP. While there is an Office of Sustainability, their work is not widely known by students or faculty. Using this supplemental section, this office could look to the examples of American University, WPI, and Wageningen University. The Office of Sustainability could combine sustainability and campus engagement goals by supporting academic research and student projects that reduce carbon emissions and resource consumption. UTP could implement programs similar to WPI's Green Revolving Fund and Wageningen University's Green Office to finance and run such initiatives. To promote sustainability-related academic offerings and research opportunities, UTP could implement a certification system for courses, like American

³⁵ Worcester Polytechnic Institute, [“Interdisciplinary Programs and the Future of Work”](#)

³⁶ Worcester Polytechnic Institute, [“Sustainability Plan - World Cafe”](#)

University's Green Teaching Certificate, and develop a network to connect students and faculty to sustainable research projects and academic courses, like American University's ECOllaborative.

The Office of Sustainability could also collaborate with various UTP departments to oversee the development and implementation of a more thorough sustainability inventory and CAP in collaboration with UTP administration. This work would be well-suited for a continued partnership with WPI, either through an Interactive Qualifying Project or Major Qualifying Project, or a partnership with an outside organization.

UTP could continue to strengthen relationships with universities across Panama and Latin America as a whole through networks like RUPADES and ARIUSA in order to improve and better market their sustainability-related academic offerings. Through these changes, UTP can become a leader in university sustainability practices within Panama and worldwide. WPI could also benefit from strengthening partnerships through AASHE and other regional sustainability networks. In developing the new Sustainability Plan, WPI could seek guidance from AASHE universities that perform well in the categories of *Investment and Finance* and *Water*. This would suit WPI's institutional core values of fostering collaboration and building strategic alliances, while increasing its standing as a sustainable institution.

In an increasingly global landscape, comparative analysis across universities from various corners of the world illustrates insights that might have otherwise gone unnoticed. As institutions of higher education, universities should recognize the simultaneous benefits of both collaboration and competition. Sharing strategies to reduce emissions and incorporate sustainability into academics and research helps each university perform better as a sustainable institution while combating climate change for future generations.

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