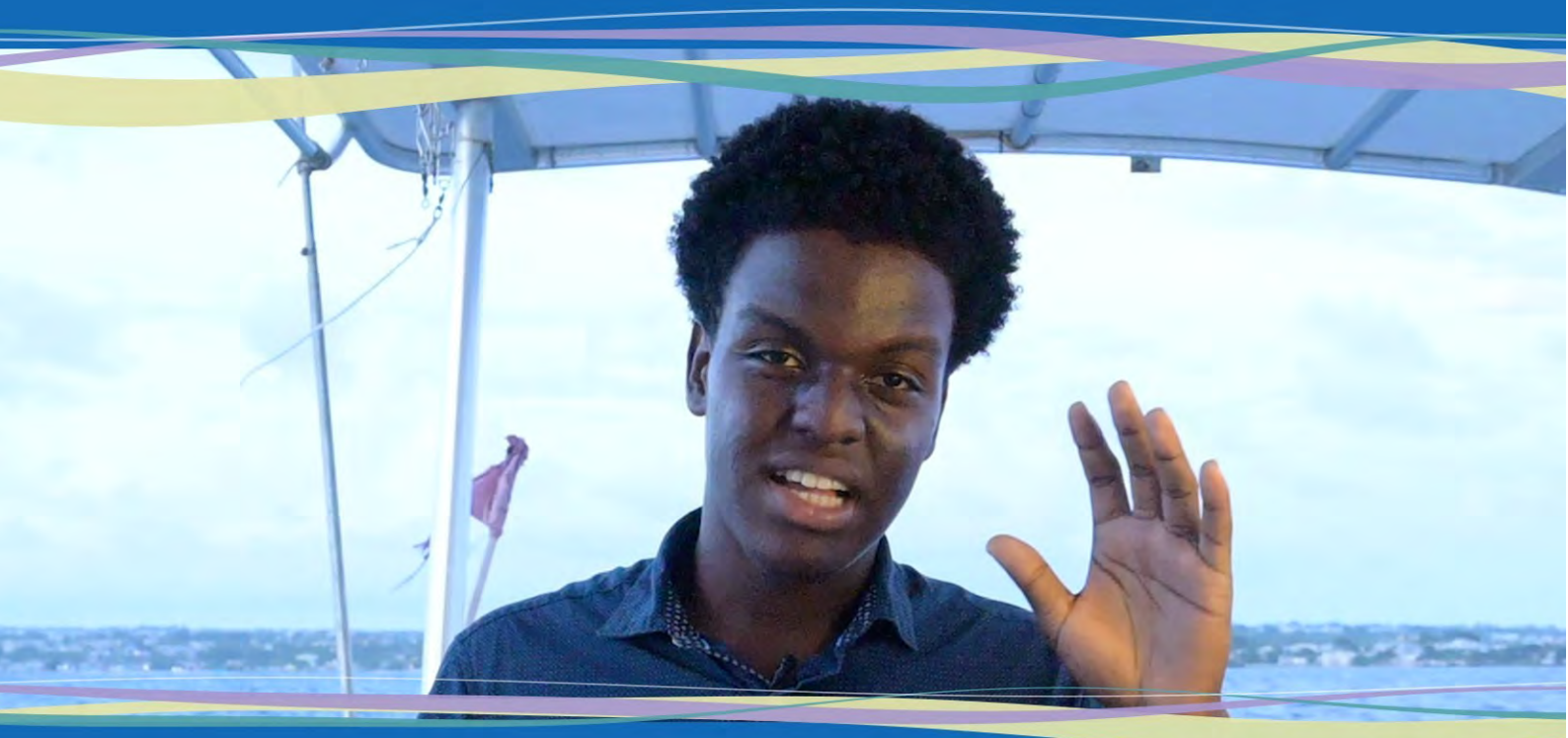
Commonwealth of Learning

A YOUTH-LED JOURNAL OF RESEARCH, INNOVATION AND ADVOCACY

THE FUTURE WE BUILD

Blue, Green and Orange Economies: Caribbean Youth Shaping Future Skills through Robotics and AI



COMMONWEALTH OF LEARNING

Pan-Caribbean Youth Robotics Innovation Project for Blue-Green Resilience and Prosperity | October 2026

The AgriSentry 1.0, a youth-built mobile robotics prototype for exploring soil intelligence for smarter, safer and more resilient agriculture.

Several community advocates are cleaning up sargassum deposits at Oistins in Barbados, a severe blue challenge that the "Shore Things" Robotics Team is seeking to address with their robotics solution called "Onshore". Credit: Shamar Blunt/Barbados TODAY.

On the cover: *Niko Jack, Barbadian youth, design and prototype team member out on the waters in Barbados.*

The Commonwealth of Learning (COL) is an intergovernmental organisation created by the Commonwealth Heads of Government to encourage the development and sharing of open learning and distance education knowledge, resources and technologies.

©2026 by the Commonwealth of Learning (COL)

The Future We Build is made available under a Creative Commons Attribution-ShareAlike 4.0 Licence (international): https://creativecommons.org/licenses/by-sa/4.0/

For the avoidance of doubt, by applying this license, the license does not waive any privileges or immunities from claims that they may be entitled to assert, nor do they submit themselves to the jurisdiction, courts, legal processes, or laws of any jurisdiction.

The ideas and opinions expressed in this publication are those of the authors; they are not necessarily those of COL and do not commit the organisations. All products and services mentioned are owned by their respective copyright holders, and mere presentation in the publication does not mean endorsement by COL.

Commonwealth of Learning
505 Burrard Street, Suite 1650, Box 5
Vancouver, BC V7X 1M6, Canada
+1.604.775.8200
www.col.org

ABSTRACT

Across the Caribbean, young people are confronting environmental and social challenges that affect the places they call home. This youth-led journal brings together six research, media and advocacy articles developed through the Commonwealth of Learning's Pan-Caribbean Youth Robotics Innovation Project for Blue-Green Resilience and Prosperity. The contributions examine biodiversity loss, ocean health and pollution, assistive robotics, water conservation, coastal resilience and food security. Drawing on regional experience, the writers consider how robotics and artificial intelligence can support practical responses, while the blue, green and orange economies connect environmental stewardship, human-centred creativity, cultural expression and enterprise. The journal also documents the complementary work of the research, media and advocacy, and the design and prototype teams, highlighting the transferable skills young participants develop through inquiry, collaborative webinars, communication, ethical use of AI and publication. Written for young people by young people, it invites readers from academic, technical, creative and entrepreneurial pathways to translate awareness into evidence-informed advocacy and action for a more inclusive, resilient Caribbean.

Keywords: *Caribbean youth; blue economy; green economy; orange economy; robotics; artificial intelligence; future skills; youth advocacy*

EDITORS

Schontal Moore, PhD
Education Specialist, Commonwealth of Learning

Stacey Payne-Mascall
Assistant Director of Education, Planning, Training, Research and Education Services, Planning Unit, Ministry of Education, Antigua and Barbuda

Jamie Usher
Vice Principal, Saint Catherine Academy; President, Belize Robotics Federation

About this publication

This publication celebrates the research, writing, webinar presentations and advocacy contributions of Caribbean youth, recognising their creativity, leadership and commitment to addressing regional challenges. Each article acknowledges its writers and webinar contributors, honouring their individual and collective contributions. The youth-led innovation concepts presented throughout the journal demonstrate emerging ideas and proposed solutions, highlighting the potential of robotics, artificial intelligence and creative innovation to advance a more sustainable, inclusive and resilient Caribbean.

Table of Contents

Editors ... 3

About this publication ... 3

INTRODUCTION

When young people tell the story of innovation ... 5

- The future begins with a question ... 5
- How the project became a conversation ... 5
- Where the blue, green and orange economies meet ... 6
- Six windows into a shared Caribbean future ... 7
- Learning the future by practising it ... 8
- AI as a tool, judgement as a skill ... 9
- An invitation to the reader ... 9

SECTION 01 · BIODIVERSITY LOSS

Protecting Caribbean Marine Ecosystems: How Young Innovators Can Make a Difference ... 10

SECTION 02 · OCEAN HEALTH

Saving Our Seas: The Caribbean Ocean Is Our Home, Our Heritage and Our Future ... 14

SECTION 03 · ASSISTIVE ROBOTICS

Bionics for the Caribbean: Designing Technology That Includes Everyone ... 17

SECTION 04 · WATER CONSERVATION

Every Drop Has a Future: Rethinking Caribbean Water Conservation ... 20

SECTION 05 · COASTAL RESILIENCE

Building Caribbean Coasts: The Role of Robotics, Creativity and Policy ... 23

SECTION 06 · FOOD SECURITY

Growing the Future: How Robotics, AI and Youth Innovation Can Strengthen Caribbean Food Security ... 26

Editorial and publication note ... 29

INTRODUCTION

When young people tell the story of innovation

The future begins with a question

What does the future of the Caribbean look like through the eyes of a young person standing at the water's edge? Perhaps it begins with a beach that has changed since childhood, a river that no longer runs reliably, a reef whose colours have faded, or a farmer wondering whether the next harvest will survive the heat. Perhaps it begins somewhere less expected: with a young athlete imagining how to move confidently after losing a limb, or a student discovering that a few lines of code can help make sense of a problem that once seemed too large to touch.

Across our islands and mainland Caribbean communities, these questions are not distant predictions. They sit inside everyday life in the food we buy, the roads we travel, the homes we protect, the livelihoods our families build and the environment we hope to pass on. Yet alongside the challenges is another story: one of young people who are not content to be spectators. They are curious. They ask difficult questions. They see possibilities in engineering, design, public dialogue and technology, even when they do not yet have every tool or every answer.

This publication grows from that second story. It brings together six youth-led articles developed through the Commonwealth of Learning's Pan-Caribbean Youth Robotics Innovation Project for Blue-Green Resilience and Prosperity. Written for young people by young people, the collection is both an exploration of pressing Caribbean challenges and an invitation to imagine what we can create in response. Its purpose is awareness, certainly, but also responsiveness, critical thinking, advocacy, collaboration and action.

How the project became a conversation

The project began from an important understanding: technology is most meaningful when it starts with the needs of people and places. Robotics can help observe a shoreline, analyse a crop, collect measurements or support a person's movement. However, deciding which problem deserves attention, and whether a proposed solution is safe, affordable, inclusive and useful, requires something more. It requires investigation, listening and the ability to communicate why the work matters.

For this reason, the initiative brought young people between the ages of 16 and 23 into two complementary spaces. The design and prototype (D&P) teams explore solutions through engineering, coding, sensors, physical design and experimentation. Alongside them, the research, media and advocacy (RMA) groups examine the challenges those inventions might address. They ask who is affected, what evidence already exists, which local conditions must be considered and how the public can take part. One pathway investigates what could be built; the other helps clarify why it should be built, for whom and under what conditions.

The distinction is not a division of importance. Without research, a clever invention may solve the wrong problem. Without communication, a promising prototype may never be understood by the people who could benefit from it. Without advocacy and public engagement, an innovation may remain a classroom exercise instead of becoming part of a wider conversation about change. The RMA groups have helped create the knowledge, context and visibility through which the D&P teams' efforts can be questioned, refined and appreciated. In doing so, they have contributed to the innovation process itself, rather than simply publicising it.

Their work took shape through recurring collaborative sessions and a six-part youth-led webinar series in September and October 2026. Each theme became a meeting place for evidence and lived experience, where regional challenges could be examined and shared with wider audiences. Preparing a webinar meant identifying the story, assigning roles, researching the issue, building a persuasive presentation and translating specialist concepts into language other people could follow. Writing the articles that follow extended that exercise: a presentation became an argument on the page, a question became a research direction, and a set of separate youth voices became a regional conversation.

Where the blue, green and orange economies meet

The six contributions invite us to reconsider what an economy can mean. The blue economy speaks to the sustainable use and stewardship of oceans, coasts and marine resources. The green economy asks how communities can conserve resources, reduce environmental harm and build resilience. The orange economy, encompassing culture, creative design, storytelling, media and intellectual property, helps ideas travel, become meaningful to people and grow into new forms of enterprise. In the Caribbean, these are not separate destinations. They overlap in the same beach community, fishing boat, farm, classroom, workshop and household.

A sensor may indicate declining water quality, but a compelling visual story can help residents understand why those numbers matter. A drone may map a changing shoreline, but an interactive simulation can show a family what that change could mean for its home. A carefully designed prosthetic component may restore an important function, while human-centred design makes it more comfortable, expressive and suited to the person who will use it. A farm might collect soil-moisture readings, while a creative entrepreneur develops a locally grown product and brings it to market. Each example shows that technology and creativity gain power when they work together.

Artificial intelligence adds another layer, though it should not be mistaken for an answer on its own. AI-enabled tools can help classify images, identify patterns in sensor data, support language work and explore design possibilities. Robotics can extend sensing and physical action into settings where repeated human monitoring is difficult. Yet decisions still belong to people: people who understand the community, challenge unreliable results, safeguard privacy, protect ecosystems and decide when a low-tech approach is preferable.

Across these articles, the question is never simply 'Can AI do this?' It is 'Will this help, who benefits, and what must we do responsibly to make it work?'

Six windows into a shared Caribbean future

The collection opens with biodiversity loss, and with an image many Caribbean readers will recognise: a coastline that looks beautiful from above while a less visible struggle unfolds beneath its surface. The young writers trace threats to coral reefs, marine wildlife and the delicate relationships among species, drawing on examples from Trinidad and Tobago and Barbados. Their discussion of lionfish, grazing reef fish, bleaching and marine debris reminds us that protecting biodiversity means understanding relationships, not just saving individual animals. Their proposed ReefGuard AI concept imagines underwater observation strengthened by image recognition, while creative games, films and immersive experiences could turn conservation research into public understanding. Here, the blue and green economies meet the orange economy through ecological knowledge, marine technology and environmental storytelling, and point towards future work in conservation science, data analysis, GIS, media and responsible technology design.

The second article travels from the beach back to the roadside drain, asking us to notice how a discarded bottle can become an ocean problem. Ocean health and pollution are presented not only as matters of litter, but as a connected story involving waterways, mangroves, coral reefs, marine wildlife, public systems and livelihoods. The writers draw on Trinidad and Tobago and Jamaica, and explore the complexities of sargassum and the gap between environmental policy and implementation. Their DrainWatch proposal invites readers to imagine practical monitoring before litter reaches the sea, while also insisting that any design must be safe for drainage and wildlife. The article shows why future ocean protection needs environmental monitoring, engineering, public policy, waste systems, creative campaigning and youth-led community action in equal measure.

Then the journal turns towards the human body. Assistive robotics reminds us that a more resilient Caribbean must also be an inclusive one. Through imagined lives interrupted by limb loss, the authors ask what mobility, independence, and dignity cost when advanced devices are difficult to access. They open up the engineering behind powered prosthetics, from motors and sensors to control systems, and examine where AI-assisted adaptation may contribute. Their Project Axolotl idea puts Caribbean design, 3D printing and cross-disciplinary learning at the centre of a possible response. However, the deeper message is one of co-design: devices must be developed with users and health professionals, not merely for them. This is a future-skills story about mechatronics, rehabilitation technology, digital fabrication, ethics, creative identity and social entrepreneurship.

Water conservation begins with a deceptively simple challenge: if rain falls again, why should we worry about scarcity? The authors resist easy answers and introduce the 'soft path', an approach that asks how water is used, where it is lost, what quality is needed and how communities can conserve it before rushing to build more supply. Caribbean cistern traditions, leaks in distribution systems, and irrigation practices provide the setting for discussing acoustic sensors, smart valves, robotic inspection and data-assisted water management. Just as importantly, young artists, designers and communicators can make conservation visible and relevant, while technicians, plumbers, programmers and planners make systems work. This article broadens the idea of innovation: the most important solution may begin with a better question rather than a more expensive machine.

Coastal resilience takes us to shorelines where loss can be measured in metres but felt in homes, businesses, memories and access routes. The writers bring readers to Grenada's Sauteurs and Mt Craven, Trinidad's Manzanilla–Mayaro corridor and Jamaica's Hellshire Beach, showing that coastal interventions must be understood as parts of dynamic systems. Drones, mapping tools and AI-supported analysis may help communities observe change and assess risks; they do not remove the need for careful environmental judgement. The orange economy enters through documentary storytelling, interactive maps and public education that translate technical findings into choices communities can discuss. Future careers in geospatial analysis, climate data, environmental engineering, visual communication and policy all appear on this coastline, where protecting a place also means preserving its stories.

The final article asks readers to imagine imported food suddenly interrupted. Food security quickly becomes more than a question of farming: it involves availability, affordability, nutrition, transport, storage and a community's capacity to withstand shocks. Team RISE (Resilient Islands for Sustainable Eating) draws on Caribbean agricultural initiatives and offers a particularly important caution: equipment alone does not transform a food system. Farmers need support, markets and technologies that fit their realities. Their Smart Grow Caribbean concept links sensors and irrigation with experimentation, packaging, branding and local food enterprise. Robotics and AI can help collect information or flag crop stress, while the orange economy gives Caribbean produce new identities and market opportunities. The future food system needs growers, engineers, technicians, chefs, designers, storytellers, researchers and entrepreneurs working together.

Learning the future by practising it

If the six articles describe the challenges young Caribbean people want to confront, the work behind the pages offers another lesson: the future skills they are acquiring are already being practised. A group preparing for a weekly session must listen, negotiate roles, frame questions, assess evidence, respond to feedback and manage deadlines. Developing a webinar adds audience awareness, scripting, visual communication, public speaking and the confidence to answer questions in real time. Transforming a presentation into a publishable article demands patient revision, attribution, clear reasoning and the ability to make a complex issue accessible without oversimplifying it.

These are not minor additions to technical training. They are transferable abilities that matter in almost every field, from marine conservation and healthcare to entrepreneurship, journalism, design and public leadership. A young person may discover a talent for interviewing, editing, or research rather than building robots, and still be central to innovation. Another may begin as a presenter and go on to develop skills in data visualisation, product design or software. The project makes room for these different pathways to intersect. Some skills can grow through academic study; others through technical and vocational education and training (TVET), apprenticeships, micro-credentials, mentorship, open learning, community action and the disciplined experience of making something useful together.

There is also the experience of working across a region. Young people from different Caribbean settings do not always encounter the same conditions, policy environments or access to resources. Learning to collaborate across those differences is itself a preparation for future work. It encourages adaptability, intercultural understanding and the ability to see a local problem as part of a larger system. These relationships may later become professional networks, partnerships, enterprises or communities of practice. For now, they are evidence that learning can happen through purposeful collaboration as well as in formal classrooms.

AI as a tool, judgement as a skill

The emergence of generative AI has changed the landscape through which young researchers and creators work. An AI assistant may offer a first outline, help clarify unfamiliar terminology, organise notes, suggest visual directions or help a team consider different ways to present its findings. Used thoughtfully, such tools can lower the barrier to experimentation. However, they can also produce false citations, smooth over local differences, manufacture convincing images or give uncertain claims the appearance of authority. Becoming familiar with AI therefore means learning both its possibilities and its limits.

For RMA contributors, responsible practice involves checking claims against credible sources, preserving original authorship, respecting intellectual property, recognising bias and deciding when a generated image distorts the Caribbean reality they are trying to represent. It also involves artistic judgement: choosing a photograph, phrase, graphic or metaphor because it communicates something true and useful, not simply because software can produce it. Ethical judgement matters just as much. Whose voice is missing? Has the person shown in an image consented? Does the technology serve the people affected by the problem? Could the same goal be achieved more simply or affordably?

These questions position AI literacy alongside research literacy, design literacy and responsible citizenship. The next generation will need to do more than operate digital tools; it will need to question outputs, collaborate with others, protect trust and take responsibility for decisions. The RMA pathway provides a meaningful setting in which those habits can be developed as the participants learn to tell stories with evidence and imagination.

An invitation to the reader

The articles that follow do not claim that six proposed innovations, six webinars or six articles can solve every challenge facing the Caribbean. They offer something both smaller and more enduring: an example of young people stepping into conversations that will shape their lives and refusing to treat themselves as too young to contribute. Their voices remind us that awareness can become investigation, investigation can inspire design, design can prompt dialogue, and dialogue can lead to action.

This journal honours the young writers and webinar contributors whose curiosity, persistence and collaboration made those conversations possible. It also recognises the design and prototype teams whose experiments help bring possibilities into focus. Together they show that innovation is not just what happens when a robot moves or an algorithm produces an answer. It happens when people learn to identify a need, imagine responsibly, test a possibility, tell the story clearly and invite others to improve it.

So, as you turn the pages, do not read only to discover what other young people have written. Read to identify the challenge that matters to you. Notice the skills you already possess and the ones you would like to learn. Ask who you might work with, what evidence you need and how your creativity could make an idea useful to your community. The future of the Caribbean will not be shaped by technology alone. It will be shaped by people who decide what technology is for. You may be one of them.

Protecting Caribbean Marine Ecosystems: How Young Innovators Can Make a Difference

Article writers: Kyron Quashie and Qiana Ellis
Webinar contributors and presenters: Kyron Quashie (group leader); Layota Walters (curator); Qiana Ellis (media lead); Maya Hakim (editor); Narain Sookdeo (policy voice)
Webinar theme: Biodiversity Loss • 29 September 2026

Growing up in the Caribbean, it is hard to imagine our islands without the sea. Think of an afternoon liming at Maracas or Mayaro in Trinidad, the sound of waves against the shore, or the extraordinary sight of leatherback turtles coming ashore at Grande Riviere and Matura. For many of us, these are more than beautiful places or exciting experiences. They are part of our memories, our culture and what makes home feel like home. Yet it is possible to love the sea and still know very little about the life beneath it. We see the blue water, but not always the ecosystems working quietly to keep it alive.

That is what makes biodiversity loss so important to our generation. Biodiversity means the variety of living things, the differences among them and the ecosystems they form together. When species disappear, habitats deteriorate, or relationships between organisms are disrupted, we lose more than individual plants and animals. We weaken systems that support fisheries, tourism, coastal protection and everyday life. In small Caribbean states, where communities are closely connected to the natural environment, protecting biodiversity is also about protecting livelihoods and possibilities for our own future. We cannot build a sustainable region while allowing the living foundations of that region to disappear.

A coral reef is a good place to understand why. At first glance, a reef may look like a colourful underwater landscape. Look closer and it becomes a neighbourhood where many species depend on one another. Corals provide habitat. Small fish shelter among their structures. Parrotfish and surgeonfish graze on algae, helping prevent it from dominating reef surfaces. A change affecting one group can travel through the wider food web. When unusually warm seawater stresses corals, they may expel the tiny algae living in their tissues, making the corals appear white. This is coral bleaching. Bleaching does not always mean immediate death, but repeated or prolonged heat stress can make survival and recovery much harder.

Now imagine that the same reef must also cope with an invasive predator. The red lionfish, originally from the Indo-Pacific, spread through parts of the western Atlantic and Caribbean and was recorded in Barbados in late 2011. With its distinctive striped body and venomous spines, it is striking to look at, but its presence can disrupt established relationships among reef species. The lionfish feeds on native fish, including species that help sustain reef food webs. A review by del Río and colleagues (2023) describes why its feeding behaviour and reproductive characteristics have made it a concern across invaded ecosystems. The important point is not that one fish alone destroys a reef. It is that an already stressed ecosystem can become more vulnerable when pressures accumulate.

However, environmental stories are rarely as simple as 'a new species arrived, so everything got worse.' Research from Barbados offers a more hopeful and more useful lesson. Henri Vallès, Julian Walcott and Hazel Oxenford (2025) compared reef and fisheries observations before and roughly a decade after lionfish became established. They found no detectable decline in the biomass of key grazing fish such as parrotfish and surgeonfish, although damselfish biomass declined where lionfish was more abundant. The researchers suggested that sustained lionfish fishing may have helped keep its effects in check. That finding matters because it reminds us that evidence can challenge our assumptions, and well-informed community action can make a difference. Conservation requires us to keep asking questions, measuring change and adjusting what we do.

Not every danger to biodiversity arrives as a new species. Some of it begins with what we discard on land. Picture a plastic bag dropped near a drain after a busy day. Rain carries it into a stream; the stream carries it into the sea. For us, the bag may be forgotten within minutes. For a turtle searching for food, it may become a dangerous mistake. Leatherback turtles feed largely on jellyfish, and floating plastic can resemble their prey. In a study of historical records involving 408 leatherback turtles, Mrosovsky et al. (2009) reported plastic in the digestive tracts of 34% of the animals examined. That figure comes from the particular records studied, not from a count of all turtles everywhere, but it gives the danger a disturbing reality. Waste that starts with an individual decision can end in an animal's body.

The consequences do not stop with turtles. Discarded fishing lines may entangle marine creatures. Larger plastic objects break into smaller fragments that are difficult to remove, while pollutants can affect organisms and their habitats in complicated ways. Arienzo's (2023) review of persistent pollutants and marine turtles shows that chemical contamination belongs in the same conversation about ocean health. For Caribbean families who depend on fishing, coastal businesses or healthy beaches, these are not distant scientific concerns. Damage to marine ecosystems may ripple outward into work, income, food and recreation. A coastline can still look picturesque while the living systems beneath the surface are under strain.

The scale of these challenges can make us feel that only governments or major research institutions can respond. What if, instead, young people helped communities see changes earlier and act on better information? This is where robotics and artificial intelligence become interesting, not because they offer magical solutions, but because they can expand what conservation teams are able to observe. Underwater cameras and remotely operated vehicles can record hard-to-reach sections of a reef. Sensors can track conditions such as temperature and water quality. A geographic information system can organise observations on a map, allowing communities to compare places and changes over time. AI-based image analysis may help identify patterns in large collections of photographs that would otherwise take many hours to review.

This is already an active area of research. Contini and colleagues (2025) investigated how underwater images, aerial drone images and AI-based methods could be combined to monitor coral reef habitats across different scales. Their work demonstrates the promise of technology for environmental observation, while reminding us that the results depend on sound methods, trustworthy data and careful interpretation. A computer-generated label is not automatically a scientific fact. A photograph may be unclear; an algorithm may classify something incorrectly. Local marine knowledge, trained researchers and repeated field checks remain essential. To use AI responsibly, we need curiosity as well as caution: What data did the system learn from? What could it miss? Who checks its conclusions?

Our group's proposed ReefGuard AI concept imagines how this approach might be made meaningful for younger innovators. Picture a school or community team working alongside marine scientists and fisherfolk to place affordable underwater cameras near a permitted coral nursery. Students could compare images over time, explore AI-assisted tools to flag possible bleaching, note plastic accumulation and record possible lionfish sightings. They might then share a simple visual dashboard with conservation partners to inform further surveys or a community clean-up. ReefGuard AI remains a proposed idea, not a tested or deployed device. Before it could be used in the sea, the team would need expert supervision, appropriate permissions, a realistic budget, reliable measurements and safeguards against disturbing marine habitats. Even so, the concept begins with something powerful: a young person noticing a problem and asking whether a practical tool could help.

Yet collecting information is only half the challenge. People must also understand why it matters. Imagine two groups returning from a reef survey. One publishes a technical spreadsheet that few people open. The other combines its findings with a short film, an interactive map, a reef-inspired game or an exhibition featuring the stories of local fishers. Both may have useful evidence, but the second group might reach a teenager, parent or community leader who never expected to care about coral. This is where the orange economy, which encompasses creative work, design, digital media, cultural expression and entrepreneurship, connects with the blue and green economies. Science helps us understand the reef; creativity helps that understanding travel; and responsible innovation helps turn it into action.

The people making those connections will not all have the same talents or career goals. Some may become marine scientists, robotics technicians, drone operators, environmental data analysts or conservation officers. Others may use graphic design, animation, journalism, filmmaking, software development or marketing to translate environmental evidence into experiences that people remember. A student learning electronics through technical and vocational education and training (TVET) could build or maintain a sensor. Someone studying visual arts could develop a compelling awareness campaign. A young entrepreneur might create a service for coastal monitoring or environmental education. None of these paths makes another less valuable. Protecting biodiversity requires the kind of teamwork in which different disciplines strengthen one another.

There is also a bigger question about the skills we choose to develop. AI can assist with organising information, exploring patterns or testing ways to communicate an idea, but it cannot take responsibility for our judgement. We still need to verify what is true, credit the work of others, respect communities, recognise uncertainty and decide whether a creative message is fair. If we learn coding without ethics, communication without evidence or conservation without listening to local people, we risk producing impressive-looking projects that fail the very communities they are meant to serve. Future skills are therefore not only technical. They include critical thinking, collaboration, empathy, creativity, environmental understanding and the confidence to keep learning.

The first step does not have to be expensive or complicated. A student could join a turtle conservation activity, help document a beach clean-up, learn to identify local marine species or interview fishers about changes they have observed. A school club could record what types of litter are found near drains, use a simple chart to explain the results and present practical recommendations to the community. Those interested in robotics could begin with a small sensor or camera project in a safe learning setting before attempting anything underwater. The goal is not to build a robot for the sake of having built one. It is to understand a real problem well enough to decide what kind of action, whether technological, creative, behavioural or policy-related, will actually help.

For our generation, the Caribbean Sea cannot remain just the background of a holiday photo or somewhere we visit on a weekend. It is a living part of who we are, and its future is tied to ours. We have inherited serious challenges, but we have also inherited knowledge, creativity, community traditions and new technologies that earlier generations could only imagine. We can use them to ask better questions, advocate for cleaner waterways, support conservation teams and design solutions grounded in Caribbean realities. So think of the beach, reef, mangrove or animal you care about most. Find out what threatens it. Bring a friend, a teacher, an artist, a coder or a community expert into the conversation. Start with one informed action and build from there. The future of our islands will not be decided only in laboratories or government offices. It will also be shaped by what young Caribbean people choose to notice, learn, create and protect today.

REFERENCES

Arienzo, M. (2023). Progress on the impact of persistent pollutants on marine turtles: A review. Journal of Marine Science and Engineering, 11(2), 266. https://doi.org/10.3390/jmse11020266

Contini, M., Illien, V., Barde, J., Poulain, S., Bernard, S., Joly, A., & Bonhommeau, S. (2025). From underwater to drone: A novel multi-scale knowledge distillation approach for coral reef monitoring. Ecological Informatics, 89, 103149. https://doi.org/10.1016/j.ecoinf.2025.103149

del Río, L., Navarro-Martínez, Z. M., Cobián-Rojas, D., Chevalier-Monteagudo, P. P., Angulo-Valdes, J. A., & Rodriguez-Viera, L. (2023). Biology and ecology of the lionfish Pterois volitans/Pterois miles as invasive alien species: A review. PeerJ, 11, e15728. https://doi.org/10.7717/peerj.15728

Mrosovsky, N., Ryan, G. D., & James, M. C. (2009). Leatherback turtles: The menace of plastic. Marine Pollution Bulletin, 58(2), 287–289. https://doi.org/10.1016/j.marpolbul.2008.10.018

Vallès, H., Walcott, J., & Oxenford, H. A. (2025). No change in key reef fish herbivores or reef fisher yields in Barbados a decade after the lionfish invasion. Scientific Reports, 15, Article 6253. https://doi.org/10.1038/s41598-025-90218-6

Saving Our Seas: The Caribbean Ocean Is Our Home, Our Heritage and Our Future

Article writers: Dalika Twitts and Amirah Asphall

Webinar contributors and presenters: Cameron Thomas; J'don Daniel; Cherisse Phillips; Dalika Twitts; Amirah Asphall; Ayana Hanooman; Arian Soulage

Webinar theme: Ocean Health • 6 October 2026

A bottle dropped beside a road in Trinidad might never be seen by the person who threw it away again. Rain can carry it into a roadside drain, down a river and eventually towards the Gulf of Paria. By the time it reaches the coast, what looked like one small act has become part of a much larger story. Many of us grew up thinking of ocean pollution as the rubbish we see on beaches. The truth is less convenient: to protect our seas, we have to look at the choices, systems and waterways that connect our neighbourhoods to them.

Across the Caribbean, the ocean is a source of food, work, recreation and identity. Coral reefs shelter fish and help reduce incoming wave energy. Mangroves hold sediment along shorelines and provide nursery habitats, while seagrass beds support marine life. Their health matters to a fisher landing a catch, a tour guide showing visitors a reef and a family living near the water. When sewage, plastics, oil or excessive nutrients damage these habitats, biodiversity is affected first, yet the consequences soon reach livelihoods and local economies. Ocean health is not a single environmental issue. It is a chain of relationships between land, sea and people.

The United Nations Environment Programme (UNEP), through its Caribbean Environment Programme, notes that up to 80% of marine litter in the Wider Caribbean comes from land-based solid-waste sources (UNEP, n.d.-b). This is a regional estimate rather than a measurement for any individual island, yet it shifts the way we think about responsibility. A beach clean-up matters; however, removing litter after it has travelled through a river cannot replace reliable waste collection, wastewater treatment and cleaner streets. We need both individual action and effective public systems. The pollution that reaches a turtle or coral reef may have begun miles away, where nobody could see the ocean.

Trinidad and Tobago offers a vivid example. Plastic and other debris can travel from urban communities through drainage networks into coastal waters, with consequences for mangroves, marine life and beach users. In Jamaica, coral reefs face pressures from warming seas, pollution, damaging coastal practices and

changes in reef fish communities. A reef can sometimes recover with better water quality, protected habitats and sustained management, but restoration is not a quick fix. Even floating sargassum shows why ocean stories require nuance. Out at sea, this brown seaweed provides habitat for marine organisms; when exceptionally large quantities wash ashore and decompose, they can disrupt tourism and fishing, impair nearshore conditions and release irritating gases (NOAA Ocean Exploration, 2024). The same natural material can be valuable in one place and harmful in another.

This complexity helps explain why a law or an inspiring slogan is not enough. Caribbean governments have marine protection rules and conservation programmes, but implementation requires monitoring, budgets, cooperation and public trust. There is little value in announcing a protected area if pollution continues to enter it unchecked. Equally, telling households to recycle makes little sense without accessible collection and processing options. Young people can ask difficult, constructive questions: Where does local rubbish travel? Which drains overflow? Who collects information about the water? What happens after a clean-up? These questions turn concern into evidence that communities can use.

Robotics and artificial intelligence can add new ways of finding answers. A remotely operated underwater vehicle can record reef conditions where repeated diving is difficult. Low-cost sensors can measure temperature, turbidity and other indicators, while image-recognition software may help a researcher sort photographs and identify patterns that deserve closer study. It is easy to imagine a machine cleaning an entire coastline by itself. In practice, good engineering begins with a smaller, safer question and honest testing. A robot intended to collect rubbish near a drain must not obstruct floodwater or harm wildlife. AI can flag possible litter, but people must inspect its mistakes and decide what action is safe.

Consider DrainWatch, the youth group's proposed idea for using a camera or sensor to identify rubbish collecting at a selected drain. Instead of attempting to remove everything mechanically, an early version might simply alert a trained clean-up team and record how frequently the problem occurs. Students could then compare conditions before and after community interventions. DrainWatch is a concept, not an installed or validated drainage system. Any trial would require permission, engineering supervision and checks for flooding, privacy and wildlife risks. What makes the idea useful is not the word "robotics". It is the possibility of finding a problem before the next rainfall sends it downstream.

The orange economy provides another part of the response. A student who knows how to code could create a monitoring dashboard. A graphic designer could turn the findings into an illustration that people actually understand. A filmmaker might follow a bottle's journey from road to reef, while an animator could explain why mangroves matter without turning an environmental lesson into a lecture. Creative work also opens routes into sustainable enterprises, from responsible recycled-product design to environmental media services. The blue economy's healthy seas, the green economy's resource stewardship and the orange economy's imaginative communication need one another.

These connections change what future skills look like. We will need marine scientists, plumbers, waste-management technicians, robotics designers, mapping specialists and data analysts. We will also need journalists, artists, teachers, policy advocates and entrepreneurs who can work across disciplines. School environmental clubs, TVET programmes, apprenticeships, community science and university study all offer ways to begin. AI tools may help a group examine photographs, organise findings or draft visual concepts, but young people still have to verify the evidence, respect people's images and privacy and credit the original work. A convincing graphic is not the same as a truthful one.

There is a practical challenge for every one of us. Choose a waterway or beach near your community and trace where its litter comes from. Work with an environmental organisation or local authority to document the problem, share reliable findings and press for a measurable improvement. Invite the artists and coders alongside the scientists. Make a short film, produce a map, design a careful experiment or simply speak up when a waste system is failing. If we are serious about the oceans our generation will inherit, we must also be serious about the streets and rivers that feed them. The sea begins closer to home than we think.

REFERENCES

Institute of Marine Affairs. (2022, October 10). Coastal issues. https://www.ima.gov.tt/coastal-issues/

National Environment and Planning Agency. (2019). Jamaica coral reef action plan. https://www.nepa.gov.jm/node/538

NOAA Ocean Exploration. (2024, August 21). What is sargassum? https://oceanexplorer.noaa.gov/ocean-fact/sargassum/

United Nations Environment Programme. (n.d.-a). Solid waste and marine litter management. https://www.unep.org/cep/solid-waste-and-marine-litter-management

United Nations Environment Programme. (n.d.-b). Trash free waters initiative in the Caribbean. https://www.unep.org/cep/trash-free-waters-initiative-caribbean

Bionics for the Caribbean: Designing Technology That Includes Everyone

Article writers: Abigail Levy; Ashley Chase; Dejean Simmonds; Elijah Blake; Gavrie Torres; Greg Rouse; Martina Harrison; Morann Morgan; Nathan Newman; Tahir Higgins
Webinar contributors and presenters: Abigail Levy; Dejean Simmonds; Elijah Blake; Gavrie Torres; Morann Morgan
Webinar theme: Assistive Robotics • 13 October 2026

Imagine three people on three different Caribbean streets. Archie is eighteen and has grown up learning to move through the world with limb differences. Mary is sixteen, an athlete whose life changed after an accident. Johnathon, a working parent, now faces life after a diabetes-related amputation. These are fictional people, but the question they raise is real: what happens when someone needs an assistive device and the cost, availability or specialist care puts it beyond reach? Too often we talk about robotics as something exciting in a laboratory. For a person trying to get to school, work or a football match, it could mean independence.

The challenges are not identical. A person born with a limb difference may have needs unlike someone adapting to a recent amputation. One user may prioritise a reliable, comfortable prosthetic for everyday activity; another may benefit from powered assistance for certain movements. A young person's device may also need regular adjustment as they grow. The right solution begins with listening rather than assuming that the most complicated technology is always best. Rehabilitation professionals, users and families know things about fit, comfort, skin health and daily environments that no clever algorithm can discover from a laboratory bench alone.

Access is a serious regional concern. A Jamaican study of 188 patients attending a specialist diabetes clinic found that about 8.5% had experienced an amputation; the result describes that particular clinic sample, not the entire country (Ferguson et al., 2013). For those needing prosthetic services, a device is only one part of the expense. Assessment, fitting, repairs, transport and follow-up care all matter. Imported parts may add costs and waiting time. In small island settings, specialist expertise may not be nearby. The challenge is therefore both technological and social: how can people get devices that are safe, affordable and supported for as long as they need them?

To see what makes advanced prosthetics remarkable, consider a powered knee. Systems such as the Össur POWER KNEE combine a motor, sensors, a processor and carefully designed mechanical parts to support movement. Sensors gather information about position, forces and motion. The controller uses that information to coordinate the joint's response as the wearer stands or walks. Research on powered prostheses shows why engineering must be judged by real experiences, including comfort and performance during everyday activities, rather than by impressive specifications alone (Best et al., 2025). A device that performs beautifully in a demonstration may still struggle with steep steps, unreliable charging or the rough ground someone crosses each morning.

Artificial intelligence could extend this technology by helping systems recognise patterns in movement data and adjust to some changes in gait. Researchers have examined sensor-based and machine-learning approaches to detecting a user's movement intentions (Islam et al., 2025). Yet AI is not a substitute for clinical testing. A wrongly predicted step is not just an inaccurate data point; it could be dangerous. That is why safety testing, privacy, reliable components and the ability to repair a device locally matter. Even the smartest prosthetic must answer to the person wearing it.

This is where creativity enters the story. The orange economy includes design, digital fabrication, cultural expression and other forms of creative enterprise. Imagine a prosthetic cover that reflects a young person's favourite colours or local artistic traditions, created without compromising the device's function. Imagine designers working with engineers on a comfortable socket, or a digital artist using three-dimensional modelling to explore a component before it is manufactured. Lower-cost 3D printing has been investigated for some prosthetic sockets, although it does not remove the need for professional fitting and evaluation (Van der Stelt et al., 2023). In this context, creativity is not decoration added after engineering. It is part of making technology usable and personal.

Our team's Project Axolotl concept grows from that possibility. The proposed initiative imagines Caribbean students from engineering, computing, science, health and visual arts collaborating to explore more affordable prosthetic technologies, beginning with a microprocessor knee. Local design, suitable 3D-printed components and shared procurement might reduce some costs, although the proposed savings target has not been demonstrated. The team's account describes an early bench-testing ambition; it should not be read as evidence of a clinically validated device. Before anything reaches a patient, trained prosthetists, clinicians, engineers and regulators would need to guide the process. That distinction matters because the people who most need assistive technology deserve careful innovation, not promises.

Project Axolotl also points to a wider Caribbean opportunity. Instead of imagining that every young innovator must become an engineer, we can picture a team in which a coder, a technician, a visual designer, a rehabilitation student and a business student contribute different strengths. A graduate of a TVET mechatronics programme might maintain motors and controllers. A university student might research safety systems. A product designer might help with the fit and appearance, while an entrepreneur studies whether a regional repair service could remain affordable. Through apprenticeships, micro-credentials, community projects and formal study, these pathways can build on one another.

Assistive robotics also expands our understanding of sustainability. A resilient society is not only one that protects reefs or conserves water. It is one in which people with disabilities can participate in education, employment, emergency preparedness and new green and blue economy opportunities. Designing for inclusion means asking who can enter the classroom, use the workshop, reach the shoreline or join the

innovation team. It means challenging the idea that users should simply be grateful for whatever device becomes available. They should help define the problem and judge the outcome.

So here is our invitation. Start by listening to people with disabilities and the organisations that represent them. Ask what barriers exist in your own school or community. Form a cross-disciplinary design club and work on a problem with users, not for them, under appropriate professional guidance. Share responsible ideas, advocate for accessible education and examine what policy support would make assistive services more available. We cannot promise that one youth project will change every life. We can insist that the next generation of Caribbean technology should be developed with dignity, affordability and inclusion at its centre. That future is worth designing now.

REFERENCES

Best, T. K., Seelhoff, C. A., Wensman, J., & Gregg, R. D. (2025). The clinical effects of the Össur power knee with phase-based and default control during sitting, standing, and walking. Journal of NeuroEngineering and Rehabilitation, 22, Article 200. https://doi.org/10.1186/s12984-025-01729-2

Ferguson, T. S., Tulloch-Reid, M. K., Younger, N. O. M., Wright-Pascoe, R. A., Boyne, M. S., McFarlane, S. R., Francis, D. K., & Wilks, R. J. (2013). Diabetic foot complications among patients attending a specialist diabetes clinic in Jamaica: Prevalence and associated factors. West Indian Medical Journal, 62(3), 216–223. https://pubmed.ncbi.nlm.nih.gov/24564043/

Islam, M. R., Shen, X., & Sazonov, E. (2025). Sensors and machine learning methods for intent detection in lower-limb prosthetic devices: A review. IEEE Sensors Journal, 25(12), 21054–21066. https://doi.org/10.1109/JSEN.2025.3565195

Van der Stelt, M., Verhulst, A., Slump, C. H., Papenburg, M., Grobusch, M. P., Brouwers, L., & Maal, T. J. J. (2023). Design and production of low-cost 3D-printed transtibial prosthetic sockets. Journal of Prosthetics and Orthotics, 35(1), E30–E36. https://doi.org/10.1097/JPO.0000000000000399

University of California San Diego. (2022). Student startup LIMBER makes 3D-printed prostheses affordable and accessible. https://jacobsschool.ucsd.edu/news/release/3455?id=3455

Every Drop Has a Future: Rethinking Caribbean Water Conservation

Article writers: Andre Mason and Aaliyah Pacifique

Webinar contributors and presenters: Mieka Wiles; Andre Mason; Aaliyah Pacifique; Amekia Johnson; Calyssa Cayenne; Isa Mohammed; Kaylee Clemetson; Kashinco Archer

Webinar theme: Water Conservation • 20 October 2026

When you live among islands surrounded by water, scarcity sounds like a contradiction. The sea appears in almost every postcard and, on some afternoons, rain can fall so hard that the roads seem to become rivers. Yet a household can still turn on a tap and find nothing. A farmer can watch crops wilt while another district floods. The problem is not whether water exists somewhere on the planet. It is whether enough safe freshwater is available where people need it, when they need it, and whether the systems delivering it are built to last. That is why our generation needs to think differently about what conservation really means.

Climate change adds uncertainty to rainfall patterns, and some Caribbean communities already face dry-season shortages, saltwater intrusion or unreliable distribution. Research on domestic water supply in Kingston, Jamaica, points to climate vulnerability and the importance of considering alternative sources (Townsend et al., 2020). Still, we should resist the temptation to say that every shortage is caused by the weather. A pipe may leak beneath a street for months. A storage tank may be poorly maintained. A field may receive more water than its crops need. Sometimes the fastest way to strengthen supply is not to find a new source but to stop wasting the water we already have.

This idea is at the heart of what researchers call the “soft path for water.” Rather than beginning with another huge dam or an expensive new supply system, the soft path starts with a different question: what service do people need, and how can we provide it with less waste? Peter Gleick (2003) described this approach as improving how effectively water supports human needs while protecting ecosystems. It does not mean that major infrastructure is unnecessary. It means that efficiency, local storage, sensible rules and community participation deserve attention alongside large investments. Where a traditional approach might ask, “How much more water can we produce?”, the soft path asks, “How wisely are we using it?”

Take a simple example. The water needed for drinking must meet very different standards from water used for appropriate non-potable purposes, such as some landscape irrigation. Using treated drinking water unnecessarily for every task can increase pressure on a supply network. Safe rainwater harvesting or carefully managed greywater systems may reduce some demand, provided health standards and maintenance requirements are respected. In the United States Virgin Islands, cisterns have a long history as part of household water supply. Such systems are no magic solution, since they depend on rainfall and can require cleaning and treatment. Their value lies in combining local knowledge with an understanding of limitations.

Another invisible problem is water lost before it reaches customers. Broken pipes, faulty connections and other failures contribute to what utilities call non-revenue water. Some losses are physical leaks; others involve metering or unauthorised use, so the categories should not be confused. Sensors that listen for the sound of escaping water can help technicians identify possible leaks without digging up every road. Trinidad and Tobago has also explored satellite-based approaches to locating underground leakage (Crossen, 2019). These technologies do not repair the pipes by themselves. They help people decide where scarce maintenance resources might make the greatest difference.

Agriculture raises a similar question. A farmer does not need a field to be wet simply for the sake of using water; the farmer needs healthy crops. Drip irrigation delivers water more directly to plant roots and may reduce losses compared with some conventional practices, depending on crops and conditions (Climate Technology Centre and Network, n.d.). Soil-moisture sensors can show when irrigation is needed, while automated valves can respond to measured conditions. AI-assisted systems may support decisions by combining weather, soil and crop data, but they can also fail if the sensors are inaccurate or the model has not been tested locally. That is why a trained farmer's observations remain central.

Waste management belongs in this conversation as well. Dumping litter into waterways can block drains, worsen flooding and contaminate the places where people live and work. A circular approach to resources considers how containers, materials and useful water streams can be reused safely rather than discarded without thought. These connections make water conservation more than a plumbing lesson. They tie the green economy's care for resources to community health, food production and the blue economy's protection of rivers and coasts.

The orange economy can help the soft path move from policy language into daily life. Imagine a short video following one drop of water from rainfall to a storage tank, through a household and into a garden. Imagine a school mural showing which water uses require drinking-quality supplies, or an interactive community dashboard that makes leaks and repairs understandable. Young filmmakers, designers and digital creators can help build habits, while craftspeople and entrepreneurs might create responsibly designed rainwater products or offer maintenance services. A beautiful campaign is not enough without access and infrastructure, but good communication can help people understand and demand both.

There are future careers inside every part of that picture. Plumbing and electrical trades, irrigation installation, mechatronics, hydrology, urban planning, data analysis, product design and public communication all contribute to more reliable water systems. A young person can begin by learning to measure usage, repairing a supervised training rig, helping a community survey a drainage problem or learning how to explain a technical result clearly. TVET programmes, apprenticeships, schools, university study and short skills courses create different entry points. Using AI responsibly adds another skill: checking sources, reviewing data and knowing when a computer's prediction needs human correction.

Before we ask for the most futuristic robot, we should ask whether a simpler improvement could save more water. Start with one building, school garden or neighbourhood issue. Work out where water is being lost, document it carefully and propose an achievable change to the people who can act. Help others understand why the change matters, and follow up to see whether it worked. Caribbean young people will inherit the consequences of today's infrastructure and habits, but we do not have to wait to influence them. Every drop has a future when we choose to manage it with knowledge, imagination and care.

REFERENCES

Climate Technology Centre and Network. (n.d.). Drip irrigation. https://www.ctc-n.org/node/26223

Crossen, B. (2019, February 5). Trinidad and Tobago engage new leak survey method by Utilis. WaterWorld. https://www.waterworld.com/drinking-water-treatment/distribution/article/16202984/trinidad-and-tobago-engage-new-leak-survey-method-by-utilis

Gleick, P. H. (2003). Global freshwater resources: Soft-path solutions for the 21st century. Science, 302(5650), 1524–1528. https://doi.org/10.1126/science.1089967

Townsend, D. A., Sušnik, J., & van der Zaag, P. (2020). Domestic water supply vulnerability to climate change and the role of alternative water sources in Kingston, Jamaica. Atmosphere, 11(12), Article 1314. https://doi.org/10.3390/atmos11121314

Virgin Islands Department of Planning and Natural Resources. (2025). Your health and cisterns: A USVI comprehensive guide. https://dpnr.vi.gov/wp-content/uploads/2025/05/USVI-Comprehensive-Guide_MARCH2025_English.pdf

Building Caribbean Coasts: The Role of Robotics, Creativity and Policy

Article writers: Tahir Glenn; Jesse Logie; Andrew Latibeaudiere
Webinar contributors and presenters: Andrew Latibeaudiere; Tahir Glenn; Kenroy Mullings; Jesse Logie; Janae Greenidge
Webinar theme: Coastal Resilience • 27 October 2026

Ask someone what makes the Caribbean beautiful, and beaches will probably appear in the answer. We picture blue water, white sand and a place to gather with friends. We seldom picture mangroves, wetlands or the narrow roads that connect fishing villages to markets. Yet those less photographed places are part of the same coast. When a shoreline changes, it is not only a postcard that disappears. A road may become unsafe, a shop may lose customers, or a family may wonder how long its home will remain standing. Coastal resilience starts when we recognise that the edge of the sea is also where people build their lives.

Coasts naturally change. Waves, currents and storms move sand and other sediment along the shoreline; in some places, material builds up, while in others it is carried away. Problems become more serious when sea-level rise, stronger exposure to damaging events and poorly planned development increase vulnerability. Coral reefs and mangroves can reduce some wave impacts and support biodiversity, although no natural barrier eliminates coastal risk. Ferrario and colleagues (2014) found that coral reefs can dissipate substantial wave energy, which helps explain why ecosystem protection matters alongside engineered defences. A coast is a living system, not a fixed line on a map.

Grenada provides a striking lesson. At Sauteurs in St. Patrick, a breakwater was built to help protect part of an eroding shoreline. Reporting on neighbouring Mt Craven later raised concerns that altered coastal processes and ongoing erosion threatened nearby communities (Hanna, 2024). The full causes of a particular coastal change require careful technical assessment, and it would be too simple to blame one structure for every loss. Still, the story shows why construction decisions must examine where waves and sediment will go next. Protecting one section of a coast without studying neighbouring areas may transfer problems rather than solve them.

We see similarly painful questions elsewhere. In Trinidad and Tobago, flooding and shoreline damage have affected the Manzanilla to Mayaro corridor, a road that people depend on for movement and livelihoods. In Jamaica, the retreat of the shore at Hellshire has affected a place known not only for swimming but also for its fish vendors and local culture (Murphy, 2021). If you have eaten beside the sea, travelled that road or listened to older people describe beaches from their childhood, you know that erosion is not an abstract engineering term. It changes how communities remember, work and move.

What should a young innovator do with such a complex problem? The instinct may be to draw a taller seawall or build a powerful robot, but the first useful task is often observation. Drones can capture images of a shoreline from consistent viewpoints. Ground measurements, satellite information and geographic information systems help teams compare changes over time. Computer vision and other AI methods may assist with mapping vegetation and identifying patterns in large image collections, while models can support the exploration of possible flood or storm-surge scenarios. These technologies cannot eliminate uncertainty. Their results depend on sound data, expert assessment and knowledge of how each coast behaves.

Imagine the Caribbean Shoreline Sentinel, a proposed youth concept for monitoring vulnerable stretches of coastline. A small drone could photograph a carefully selected location at agreed intervals, while a dashboard might help students compare shoreline positions or mangrove coverage. The idea could support local discussion with planners and disaster-preparedness groups. It is a proposed concept, not a proven automatic warning system. Real use would require safe flight operations, permission, suitable training, accurate surveying and checks that changes in tides or camera angles are not mistaken for erosion. In coastal work, inaccurate information can lead people to make costly decisions, so careful validation is not optional.

Even the best map cannot speak for itself. A local filmmaker could document how a beach has changed through family photographs and interviews. A game designer might develop an interactive demonstration showing how different planning choices could affect a fictional shoreline. An illustrator could turn a flood-preparedness plan into instructions young people understand. This is the orange economy bringing environmental evidence into public life. It does not replace science; it makes room for community knowledge, memory and participation. When residents can see and discuss what a model suggests, they are better positioned to question proposals that affect their future.

That mixture of skills opens new paths. Some of us may study coastal engineering, environmental science or geographic information systems. Others may train in drone operations, surveying, construction, coding, journalism, animation or community organising. Technical and vocational education and training can provide practical skills in equipment operation and maintenance, while university research and community apprenticeships offer other routes. AI literacy belongs across these disciplines, because students should understand what a model can estimate, how it may fail and why human judgement is necessary. The strongest coastal team might include an engineer and an artist as readily as a scientist and a local fisher.

There is also a role for informed youth advocacy. Coastal protection decisions should be based on evidence, public consultation, ecological impacts and long-term maintenance, rather than on whichever proposal looks most dramatic. Young people can encourage schools and local governments to share non-sensitive shoreline information, engage communities in monitoring and protect natural buffers such as mangroves. They can ask how projects will affect nearby communities, who pays for maintenance and what happens after the next storm. Advocacy is strongest when it moves beyond complaint and offers a responsible way forward.

Think about the coast you know best. What has changed since you were younger? Who is most affected, and who might have records or memories that help explain it? Start with a conversation, a photograph taken from

a safe public location or a community mapping activity. Find mentors who can help turn observations into credible evidence. Invite young artists to make the findings accessible and ask decision-makers to respond. Our coastlines will continue to change, but the way Caribbean communities prepare is not predetermined. With today's skills and today's action, our generation can help shape the resilience of tomorrow's shores.

REFERENCES

Ferrario, F., Beck, M. W., Storlazzi, C. D., Micheli, F., Shepard, C. C., & Airoldi, L. (2014). The effectiveness of coral reefs for coastal hazard risk reduction and adaptation. Nature Communications, 5, Article 3794. https://doi.org/10.1038/ncomms4794

Geoscience Australia. (2022). Coastal erosion. https://www.ga.gov.au/education/natural-hazards/coastal-erosion

Hanna, J. A. (2024, March 15). Sauteurs coastal disaster remains unresolved. NOW Grenada. https://nowgrenada.com/2024/03/sauteurs-coastal-disaster-remains-unresolved/

Ministry of Works and Transport, Trinidad and Tobago. (n.d.). Comprehensive national coastal monitoring programme: Overview. https://mowt.gov.tt/Divisions/Coastal-Protection-Unit/Comprehensive-National-Coastal-Monitoring-Programm/Overview

Murphy, J. (2021, November 1). How you can lose a beach in a lifetime. The Gleaner. http://past.jamaica-gleaner.com/article/lead-stories/20211101/how-you-can-lose-beach-lifetime

Growing the Future: How Robotics, AI and Youth Innovation Can Strengthen Caribbean Food Security

Article writer: Taffian Kerr (Team RISE (Resilient Islands for Sustainable Eating) lead)
Webinar contributors and presenters: Taffian Kerr; Adrien Baron; Daeniel Hibbert; Rejine Thompson; Alisha Primus; Nevaeha Nicholson; Aisha Abdul-Mani
Webinar theme: Food Security • 27 October 2026

Imagine waking up to the news that imported food will not reach our islands for the next two weeks. At first, the shelves may look normal. Then certain foods become scarce, prices begin to rise and families wonder what can be produced close to home. This is not a prediction that such a shutdown is about to happen. It is a question designed to make us think: how secure is a food system when so much depends on weather, transport, trade and decisions made far away? For Caribbean young people, food security is not only about farming. It is about whether our communities can feed themselves with dignity when conditions change.

Food security has several parts. Enough food must be available, households must be able to obtain it, that food must support healthy nutrition, and access must remain reliable over time. A country may grow more vegetables while families still struggle with prices. A farmer may have a strong harvest but lose much of it without storage or transport. A market may be full today and disrupted by a hurricane tomorrow. These are connected problems, which means their solutions must also connect farms, infrastructure, education, policy and enterprise.

Across the Caribbean, farmers face changing rainfall, floods, dry spells and damage from extreme weather. Some also contend with costly inputs, labour shortages, limited financing and difficulty finding steady buyers. Yet a region defined only by its challenges would leave out the work already being done. CARICOM has extended its regional food-security agenda to 2030, emphasising production, trade and resilience (CARICOM, 2025). Jamaica's Southern Plains Agricultural Development initiative illustrates how agricultural land must be supported by irrigation, access roads, drainage, training and post-harvest facilities (Agro-Investment Corporation, n.d.). Food production is a system, not simply a matter of asking people to plant more.

Now picture two farms growing the same crop. One waters at a fixed time without knowing whether the soil needs it. The other uses a soil-moisture sensor to help guide irrigation. The second farm may be able to avoid

some unnecessary watering, although good results depend on the equipment and the farmer's judgement. A greenhouse can also use sensors to follow temperature, humidity and other conditions. In Guyana, training supported by the Food and Agriculture Organization has introduced farmers and agricultural professionals to digital monitoring approaches in protected cultivation (FAO, 2026). The lesson is not that every farm needs the newest technology. It is that better information can help people make better decisions.

Robotics and artificial intelligence extend that possibility. A mobile device could travel through a greenhouse collecting images of crops. A simple automated system could adjust ventilation or irrigation when measured conditions change. An AI model might flag images that show possible pest damage, prompting a farmer to inspect the plants. These tools are promising, but we have to distinguish existing sensor training from robotic systems that are still proposed for a particular community. A false pest alert could lead to wasted money or unnecessary treatment, while missing a problem could cost a harvest. Technology should support, not replace, farmers' experience and agricultural advice.

Our Team RISE discussions kept returning to one practical concern: what happens after a new device arrives? A solar pump can stop working. A sensor can break. Internet access may disappear. Even a successful harvest can spoil before it reaches customers. This is why we believe innovation must be farmer-centred. Maintenance, technical training, financing, storage, transport and dependable markets should be planned alongside hardware. The best measure of success is not how many devices were distributed. It is whether a farmer can use them over time and whether they make production and livelihoods more secure.

The orange economy gives food security a particularly Caribbean flavour. Consider breadfruit, cassava, cocoa, sorrel or pepper. A farmer might grow the ingredient, a food scientist help create a safe product, a designer develop the packaging and a storyteller connect it to the traditions that make people care. A young entrepreneur could build a digital marketplace or a campaign that encourages consumers to try local produce. This is not creativity competing with agriculture. It is creativity helping local agriculture reach customers, add value and create jobs. The green economy supports resource-conscious production, while the orange economy strengthens the identity and enterprise around it.

Smart Grow Caribbean, our proposed youth concept, brings these threads together. Imagine students building a small demonstration garden with a soil-moisture sensor and a carefully supervised irrigation system. They could collect simple data, compare water use and investigate whether an AI-assisted image tool correctly flags signs of crop stress. At the same time, another group might design a product label or campaign for the harvest. The concept has not been validated as a farming solution; it would require controlled testing, agricultural advice and attention to safety. Its real strength is educational: students could see how science, technology, creativity and business meet around one local crop.

The career possibilities reach well beyond the field. We need agricultural technicians, irrigation specialists, software developers, engineers, food scientists, logistics coordinators, graphic designers, chefs, marketers and entrepreneurs. Someone interested in coding could develop a simple farm-record system. A TVET student could learn installation and maintenance. A young artist might build an awareness campaign about local foods. A university researcher could study how a new technique performs under Caribbean conditions. Across all these pathways, AI literacy, communication, problem-solving and ethical judgement matter as much as familiarity with equipment.

Food security will not be transformed by a single robot, a government programme or a successful school garden. It will improve when people work together, when farmers are heard and when good ideas are made practical. Start with something within your reach: grow a crop, interview a local farmer, map a problem in

how food reaches a market, or test a small water-saving idea with suitable guidance. Use your creativity to encourage others to value local food. Then ask what partnerships could take the idea further. We should not simply inherit today's food system and hope it survives tomorrow. Our generation can help grow a different future, beginning with what we learn and do now. Our abiding question to all is: "What kind of future farm or food business would you want to build?"

REFERENCES

Agro-Investment Corporation. (n.d.). Southern Plains Agricultural Development initiative. https://www.agroinvest.gov.jm/spad/

Caribbean Community. (2025). Food security initiative expanded, extended to 2030. https://caricom.org/food-security-initiative-expanded-extended-to-2030/

Food and Agriculture Organization of the United Nations. (2026, May 28). Guyana strengthens climate-smart agriculture with FAO support and digital technologies. https://www.fao.org/americas/news/news-detail/guyana-smart-agriculture/en

Inter-American Institute for Cooperation on Agriculture. (2026, July 27). ADOPT Caribbean Project, implemented by IICA, concludes leaving foundation for climate-smart agriculture across the region. https://iica.int/en/press/news/adopt-caribbean-project-implemented-by-iica-concludes-leaving-foundation-for-climate-smart-agriculture-across-the-region/

Editorial and publication note

The Future We Build reflects the Commonwealth of Learning's commitment to supporting Caribbean youth as researchers, creators, advocates and innovators. Through the Pan-Caribbean Youth Robotics Innovation Project for Blue-Green Resilience and Prosperity (2026), young participants have explored the needs of their communities, collaborated across national borders and connected research with the design of practical solutions. Their webinars, written contributions, and emerging robotics concepts demonstrate how youth engagement can strengthen environmental awareness, inclusive development and informed public action. These contributions are a foundation for continued experimentation, partnership and measurable community impact, rather than an endpoint in themselves.

The journal also highlights the relevance of education and training to the future of Caribbean work. Technical and vocational education and training (TVET), academic study, apprenticeships, micro-credentials and community-based learning can provide complementary routes into robotics, artificial intelligence, environmental monitoring, design, communications and entrepreneurship. The blue, green and orange economies offer opportunities for young people to create sustainable livelihoods by combining technical skills with cultural knowledge, ethical judgement, creativity and care for their communities. Innovations described as concepts remain opportunities for responsible development, testing and validation, with sustainability depending on local ownership, affordability, maintenance and meaningful participation.

Zaria Sterling, a youth member of the design and prototype team, reflected on the importance of collaboration during an October 2026 project meeting: "I have learnt valuable lessons about teamwork and trust – my team gives me confidence in our mission, our project and our future." That sense of shared purpose expresses the hope behind this publication. COL and its Caribbean partners envisage young people who continue asking questions, gaining future-facing skills, building enterprises and advocating for solutions that endure beyond a single project or event. The expectation is that these experiences will open pathways to further learning, leadership, productive work and lasting contributions to more inclusive, resilient and prosperous Caribbean societies.