Conservation Technology Landscape and Needs Assessment Report for Conservation-Based Civil Society Organisations (CSOs) in The Caribbean Region

Prepared by:
The Cropper Foundation

As part of the 'Project Preparatory Grant to Support Integration of Data Science and Technology in Caribbean Conservation Efforts by Civil Society'

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The perspectives, insights, and discussions reflected in this report are informed by workshop activities and feedback provided by participants and CSO representatives across Jamaica, Saint Lucia, and Saint Vincent and the Grenadines. Their contributions were essential in shaping the understanding of the conservation technology landscape and the needs of civil society organisations in the Caribbean region.

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PHOTOGRAPH CREDITS

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Executive Summary

This report presents the findings of the Conservation Technology Landscape and Needs Assessment for conservation-based civil society organisations (CSOs) in the Caribbean. The assessment was conducted under the Project Preparatory Grant to Support Integration of Data Science and Technology in Caribbean Conservation Efforts by Civil Society, implemented by The Cropper Foundation (TCF). The study focused on CSOs in Jamaica, Saint Lucia, and Saint Vincent and the Grenadines.

The purpose of the assessment was to understand the current state of technological adoption and integration among conservation CSOs, identify digital, data, and technology gaps, and examine the enabling conditions that influence the use of conservation technologies. The assessment combined participatory workshops, structured discussions, and a self-assessment methodology that explored organisational capacity across eight categories: internal systems, communications, data management, risk management, culture and skills, leadership, sustainability, and finances.

Findings indicate that while there is strong interest across CSOs in adopting digital tools, data systems, and emerging technologies such as artificial intelligence, overall levels of technological maturity remain low to moderate. Self-assessment results show important differences across countries but also reveal common structural constraints.

Jamaican CSOs reported comparatively stronger performance in communications, website, and social media presence, as well as moderate capacity in internal systems and leadership. However, significant gaps were identified in managing and mitigating risks, digital culture and skills, and financial capacity. Participants highlighted limited funding access, staff turnover, and insufficient formal systems for cybersecurity and data protection as key barriers.

In Saint Vincent and the Grenadines, organisations demonstrated strong perceived readiness in culture, people and skills, and leadership and strategy, suggesting motivation and openness to digital transformation. However, low scores in managing and mitigating risks, alongside weak data management systems and financial capacity, point to major gaps in foundational systems, especially in cybersecurity, data governance, and sustainable resourcing.

Saint Lucia recorded the lowest overall self-assessment averages. Leadership and strategy emerged as the strongest area, but sustainability and finance were identified as critical weaknesses. Participants acknowledged limited planning for sustainable technology use and insufficient financial resources to acquire, maintain, and effectively utilise digital tools and systems.

Across all three countries, several cross-cutting themes emerged. Risk management and cybersecurity are underdeveloped, despite increasing reliance on digital tools. Financing remains a major constraint, affecting hardware acquisition, connectivity, software use, and staff training. Data management systems are weaker than outward-facing communications tools, suggesting that internal systems for data collection, storage, and analysis require significant strengthening. While leadership intent for digital transformation exists, operational readiness is limited by infrastructure, funding, and systems gaps. Sustainability planning for technology use is also limited, with little consideration given to energy use, device lifecycle, and environmentally responsible disposal.

Participants linked these organisational gaps to broader national and regional contexts, including relatively low government AI readiness scores, infrastructure limitations, and uneven digital inclusion across Caribbean societies. At the same time, they identified important opportunities, including regional collaboration, shared technology resources, partnerships with academic and research institutions, use of social media and storytelling for engagement, and alignment with global frameworks such as the Sustainable Development Goals to attract funding.

The findings of this report highlight the need for targeted support to strengthen conservation CSOs' capacity to adopt and integrate data science and technology. Priority actions include training and upskilling in digital tools and data management, development of organisational risk management and cybersecurity practices, improved access to appropriate hardware and software, sustainable financing models that account for digital integration costs, and stronger data systems to support evidence-based conservation.

By addressing these gaps, Caribbean CSOs will be better positioned to participate in technology-enabled conservation, improve monitoring and decision-making, and contribute to more resilient and data-informed environmental management across the region.

1.0 Introduction

This report presents an overview of the current landscape of civil society adoption and integration of conservation technology in the Caribbean. It is informed by activities and self-assessments conducted during workshops with participants from Jamaica, Saint Lucia, and Saint Vincent and the Grenadines. These islands were identified as the target project countries during project conceptualisation as part of the CEPF portfolio.

The project was conceptualised by The Cropper Foundation (TCF) and draws on TCF's experience in sustainable development and civil society strengthening. As reflected in the excerpt below, civil society organisations (CSOs), including those working in biodiversity and ecosystem conservation, protection, and restoration, face persistent challenges related to access to finance and other critical resources.

"Small Island Developing States, and the organisations within them, face several constraints that limit their development processes and their ability to contribute effectively to sustainable development. These include narrow human and natural resource bases, vulnerable economies due to small domestic markets, limited competitiveness in international markets, and high population densities. Civil society organisations operating in SIDS share many of these structural constraints in the implementation of their work. These challenges now extend to a reduced ability to bridge the digital and technology divide. This has been highlighted in the Latin America and Caribbean region, where Digital Adoption Indices place many countries, including SIDS, significantly behind comparable countries outside the region in terms of digital technology adoption (Mohammed et al., Data4Good: An Established Framework for Supporting Civil Society Organizations)."

Definitions in this field vary. The term digital divide is often used to describe multiple, overlapping gaps related to access, affordability, skills, infrastructure, and meaningful use of technology. A 2024 ECLAC study highlights that social, cultural, economic, environmental, and political factors all shape digital transformation pathways in the Caribbean. The concept of digital inclusion brings a human-centred perspective to this process, emphasising the need to ensure that vulnerable and marginalised groups are meaningfully included.

Artificial Intelligence (AI) is among the emerging technologies with the potential to address some of the operational and analytical challenges faced by civil society. However, according to the Oxford Insights Government AI Readiness Index 2024, Caribbean governments rank seventh out of nine global regions in overall AI readiness, highlighting ongoing capacity and preparedness gaps that also affect the enabling environment within which CSOs operate.

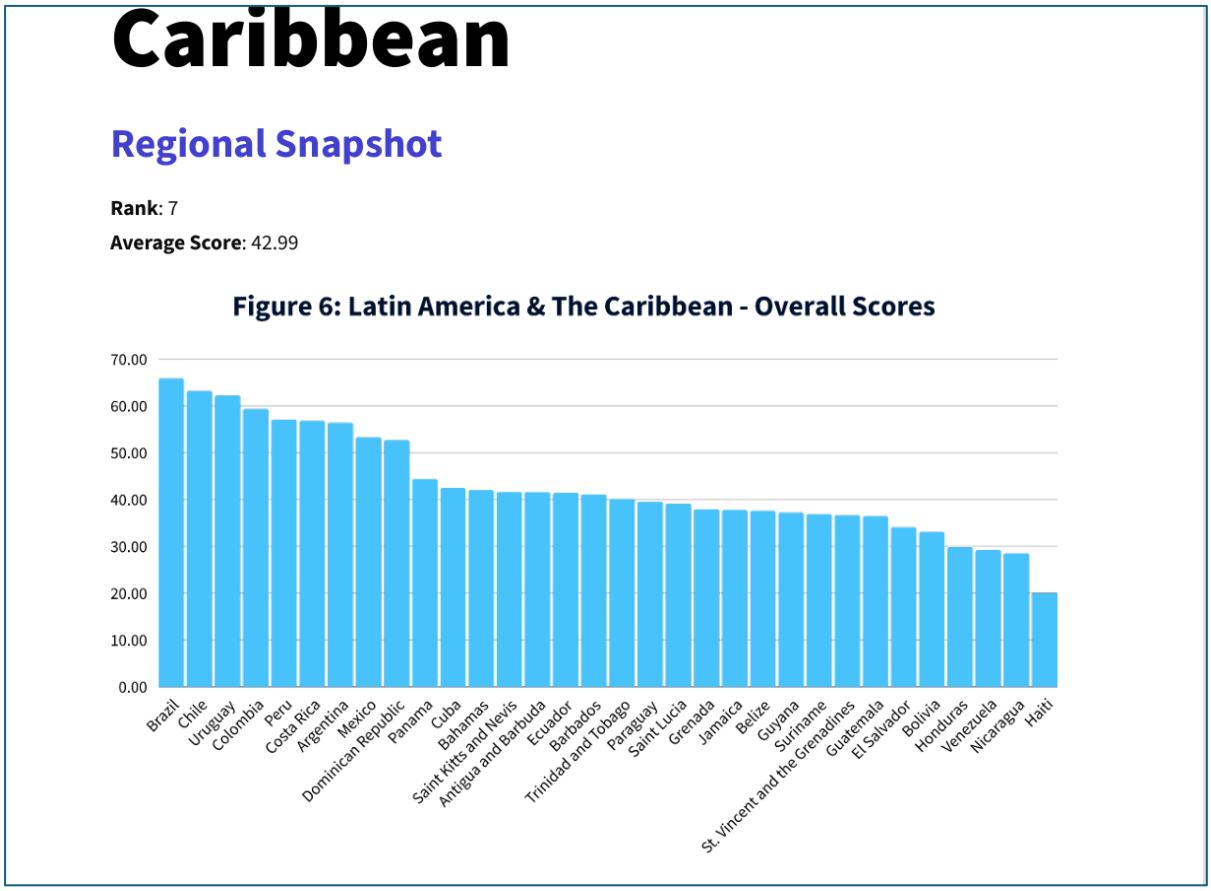


Image 1 Showing Readiness Regional Snapshot for Latin America and the Caribbean (LAC) Reference – Oxford Insights 2024

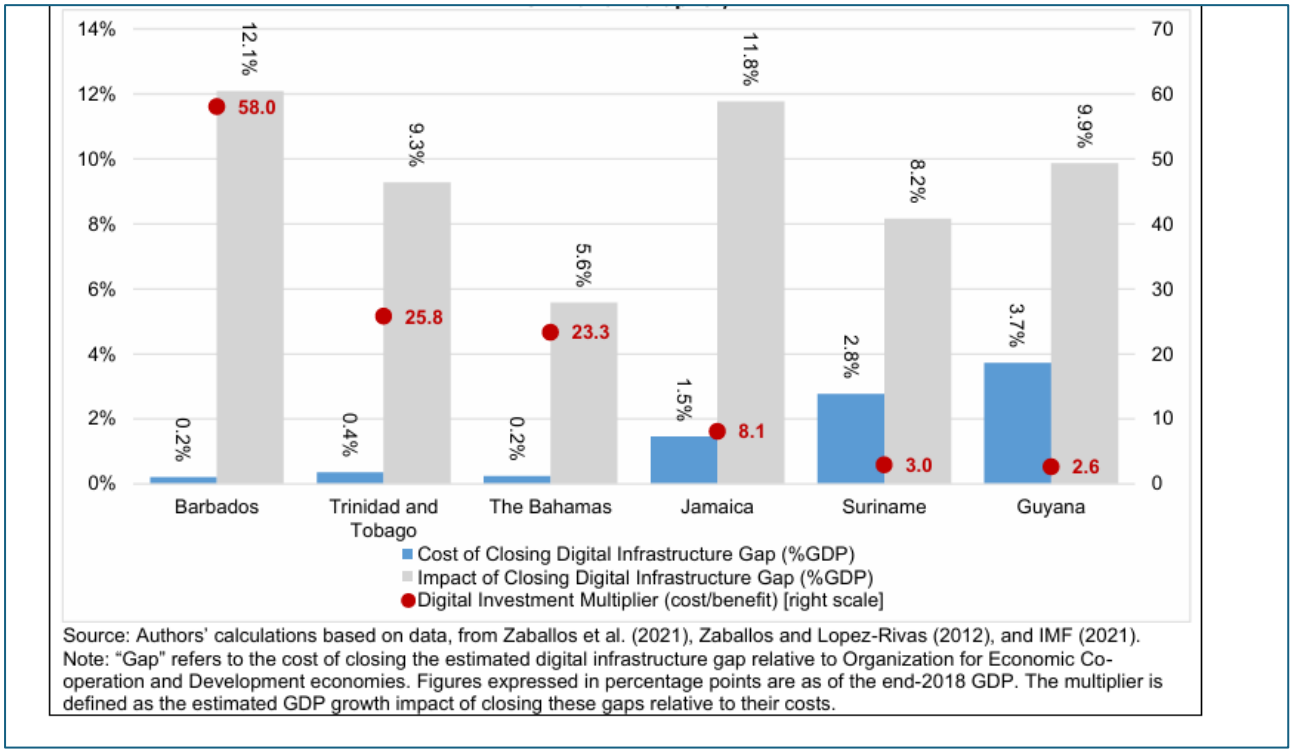
The 2024 Government AI Readiness Index assesses national readiness for artificial intelligence through 40 indicators across three core pillars: Government, Technology Sector, and Data and Infrastructure. The United States ranks first out of 188 countries globally, while the global average score is 47.59.

Within the Caribbean countries represented in this study, scores include Jamaica at 37.79, Saint Lucia at 39.11, and Saint Vincent and the Grenadines at 36.65. These scores illustrate comparatively lower levels of readiness relative to the global average.

While the Index is designed to assess how prepared governments are to implement AI in public services, it also serves as a useful proxy for understanding the broader enabling environment for the adoption of advanced technologies across society. This includes the extent to which countries are positioned to support the uptake of technologies such as AI, data science tools, and digital systems by civil society organisations. Lower readiness at the national level can signal gaps in infrastructure, policy frameworks, institutional

capacity, and data ecosystems that directly influence the operating environment of CSOs.

There are strong social and economic arguments for integrating digital technologies and data science more fully across Caribbean societies. Investments aimed at closing digital divides, including those related to infrastructure, connectivity, and digital skills, can yield benefits that significantly exceed initial costs. In Jamaica, for example, analysis has suggested that the economic benefits of closing digital gaps could reach multiples of approximately 8.1 times the estimated investment costs, contributing to gains in both Gross Domestic Product and productivity (see Image 2 for comparison across various Caribbean countries.)



Source: Authors' calculations based on data, from Zaballos et al. (2021), Zaballos and Lopez-Rivas (2012), and IMF (2021).
Note: "Gap" refers to the cost of closing the estimated digital infrastructure gap relative to Organization for Economic Co-operation and Development economies. Figures expressed in percentage points are as of the end-2018 GDP. The multiplier is defined as the estimated GDP growth impact of closing these gaps relative to their costs.

Image 2 Showing Benefit vs. Costs for Closing Digital Infrastructure Gaps in Caribbean Countries (% of GDP and Multiplier). Reference IDB 2022 - *Caribbean Quarterly Economic Bulletin*; Digital Infrastructure and Development in the Caribbean

The Inter-American Development Bank highlighted in 2022 the need for Jamaica to strengthen telecommunications and digital infrastructure, alongside physical infrastructure improvements (IDB Caribbean Quarterly Economic Bulletin, 2022). Subsequent extreme weather events, including Hurricane Melissa in 2025, would also have placed additional stress on existing infrastructure systems, underscoring the vulnerability of digital and physical systems in small island contexts and the importance of resilient, forward-looking investments.

Investments in technologies should be focused on those with the best potential to make significant and positive impacts on the state of conservation within the implementing

systems. A global online survey of 248 conservation technology users, developers, and testers identified several technologies as particularly important for advancing conservation practice. These include geographic information systems (GIS), machine learning, unmanned aerial vehicles, environmental DNA (eDNA), camera traps, and bioacoustics. Among these, machine learning and computer vision were highlighted as having especially high potential to transform conservation efforts at a global scale.

At the same time, respondents noted a range of persistent challenges associated with these technologies. These include concerns related to reliability, sensitivity, and accuracy under difficult field conditions, as well as issues of accessibility, cost, and energy efficiency, all of which can constrain uptake and effective use, particularly in resource-limited contexts. Despite these weaknesses, survey participants expressed overall optimism about the future growth of conservation technologies and the opportunities they present for improving conservation outcomes (*Speaker et al, 2021.)*

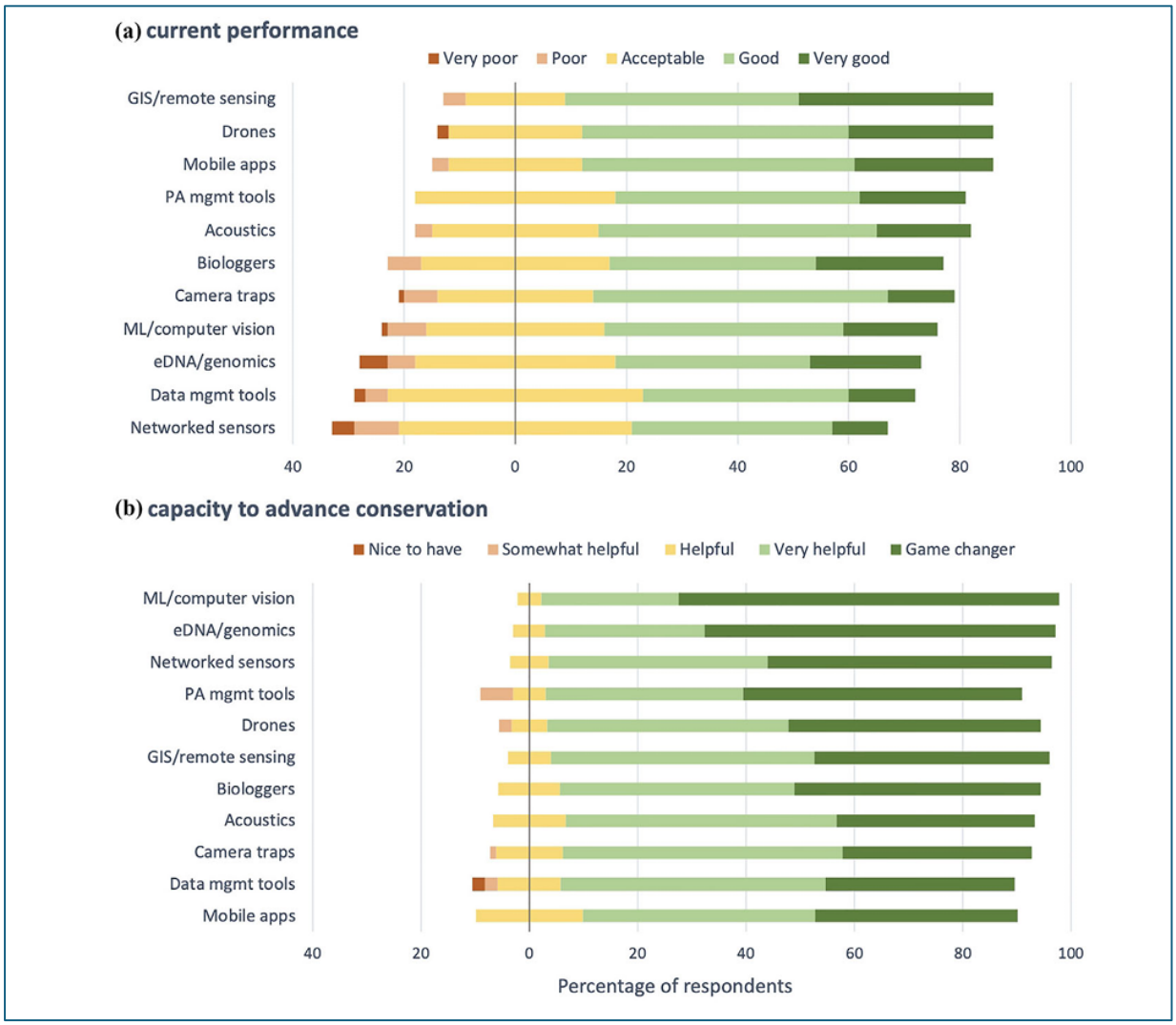


Image 3- Excerpt from Speaker et al, Global Online Survey respondent ratings of (a) overall performance of conservation technology groups and (b) their capacity to advance conservation if current problems were addressed. Reference- Speaker et al 2021

As noted earlier, the Caribbean Region is also subject to natural disasters such as hurricanes, flooding and water scarcity, all of which can cause cascading effects which impact conservation efforts and cause loss and damage to key environmental sites and habitats (*UNDRR, 2025.)* Overall, it is well accepted that the Caribbean Region, and the civil society organisations which function within it, can benefit from the adoption and integration of appropriate technologies, including those technologies which aid in conservation efforts.

2.0 Needs Assessment Methodology

In addition to structured discussion prompts and other workshop activities, participants were asked to complete a needs assessment designed to identify and map digital, technological, and data-related gaps within their organisations. This approach enabled participants to reflect on the technological maturity of their civil society organisations and supported broader inferences about the overall state of technology adoption and integration among CSOs in their respective countries. While acknowledging the influence of subjective bias and the limitations associated with small sample sizes, this methodology generated valuable insights and highlighted priority areas for further research and refinement.

Participants in each target country were provided with printed assessment wheels and colouring materials. The tool was adapted from the *Tony Robbins "Wheel of Life"* framework and customised for this exercise. Although not intended to be scientifically rigorous, the activity encouraged participants to consider their organisations from multiple perspectives. Individuals self-assessed and assigned scores, compared their results with other participants, including colleagues from the same organisation, and reflected on areas of strength and weakness.

Categories were selected to provide a holistic view of technological adoption and integration, alongside other enabling factors, such as financial capacity, which influence whether data science and technology can be effectively adopted and sustained. Category selection was informed by external references, including the TechSoup Global Network publication, Assessing Nonprofit Digital Capacity: A Guide to Digital Assessment Tools from Across the World and How They Compare (2022). This report provides an overview of digital assessment tools available to nonprofits globally and reviews twenty tools in current use. Additional literature was also considered, including

Michelotto and Joia (2024), Organizational Digital Transformation Readiness: An Exploratory Investigation.

Assessment statements were developed by TCF staff and presented idealised scenarios aligned to each category. Participants were asked to assign a percentage score indicating the extent to which their organisation had achieved the condition described, based on a careful and honest review of each prompt. Where needed, facilitators provided clarification, examples, and guidance, however participants were encouraged to complete the assessment independently using their own wheels.

An example of the prompts presented to participants, displayed via PowerPoint during the workshops, is shown below. The assessment wheel was pre-designed with the selected categories and a scoring scale from 0 to 100 percent, marked in 20 percent increments to facilitate ease of estimation and completion. A score of 0 percent was positioned closest to the centre of the wheel, while 100 percent was located at the outer perimeter.

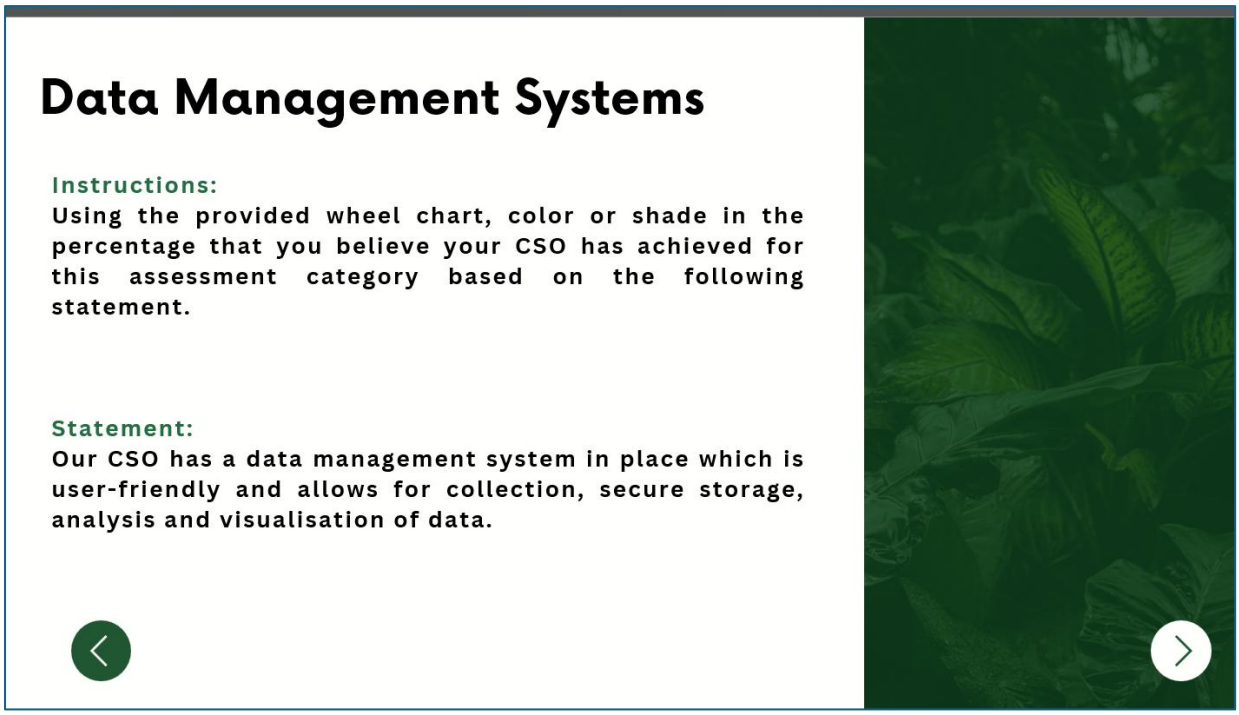


Image 4 Showing Instructions Displayed for Participants

Category	Prompt (ideal scenario)
Internal Systems	Our staff and volunteers have the necessary tools, skills, knowledge and experience to conduct daily operations, including necessary technical expertise,

	infrastructure and resources to implement projects, programs and activities. Resources may include reliable internet access and user-friendly, updated and regularly maintained devices such as computers, printers, scanners and software.
Communications, Website and Social Media	Our CSO has regularly updated, monitored and maintained stakeholder engagement channels including website and social media.
Data Management Systems	Our CSO has a data management system in place which is user-friendly and allows for collection, secure storage, analysis and visualization of data.
Managing and Mitigating Risks	Our CSO regularly examines our potential risks to cybersecurity or data breaches and has a plan to mitigate and respond to these risks.
Culture, People and Skills	Our CSO has the human resources with the motivation, creativity, innovation, confidence and support to learn and implement new digital skills.
Leadership and Strategy	Our CSO is led by persons with a clear vision, strategy and the knowledge (or willingness to learn) necessary for digital transformation.
Sustainability	Our CSO has considered and made plans for sustainable use of technology including monitoring energy usage and creating plans for environmentally conscious end-of-life/disposal of hardware.
Finances	Our CSO has the necessary financial resources to acquire and maintain new technologies, including the required staff training/upskilling needed for implementation.

Table 1 Showing Displayed Prompts for Categories

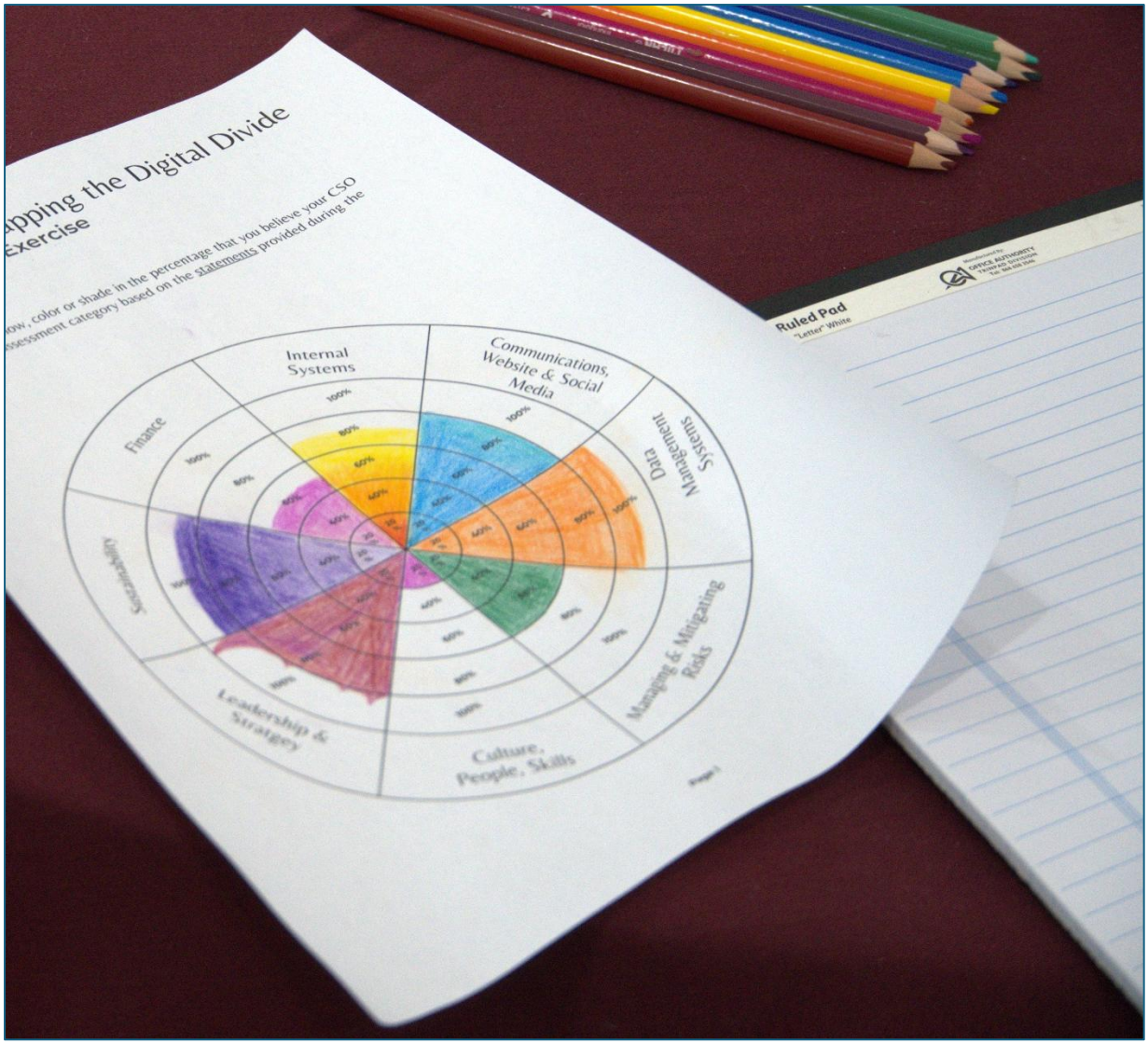


Image 5 Showing Participant's Completed Wheel Exercise in Jamaica

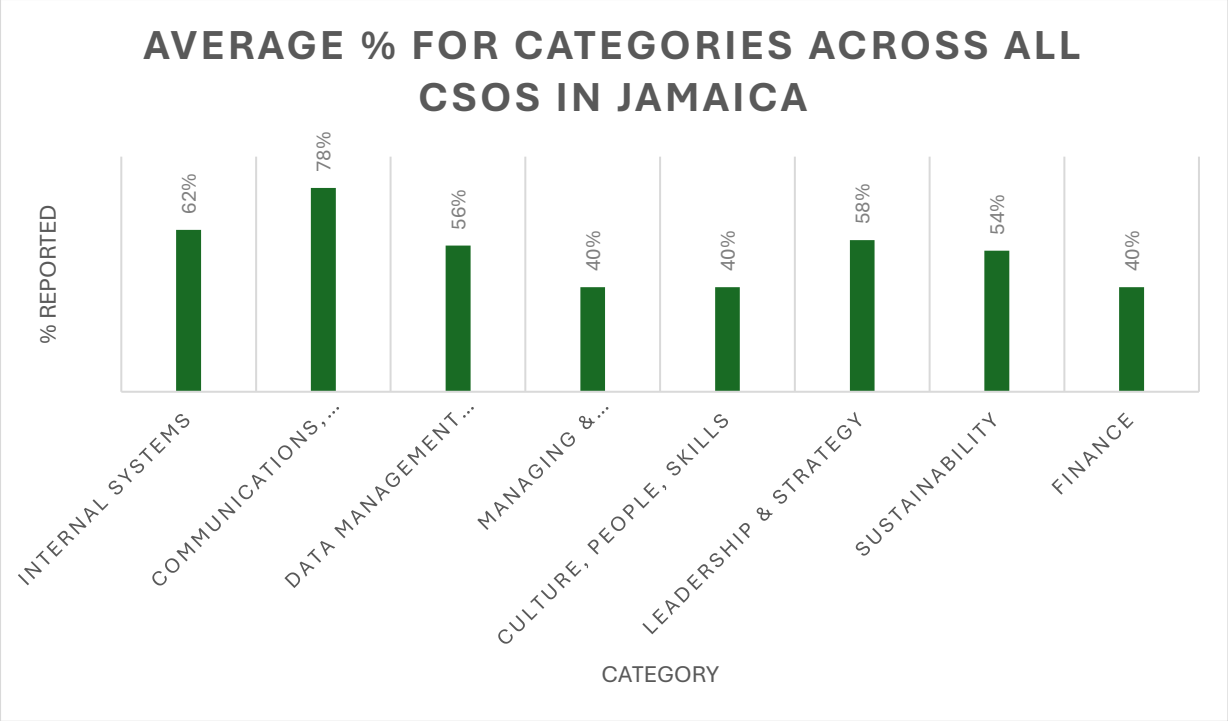
3.0 Results

3.1 Overview of Results and Interpretation Notes

Tables 2, 3 and 4 and Graphs 1-3 Illustrating the Self-Assessment Results from Each Island (Note that CSO names have been made anonymous for confidentiality)

Assessment Category	JAMAICA CSO % Achievement				
	CSO # 1	2	3	4	5
Internal Systems	70%	80%	40%	60%	60%
Communications, Website & Social Media	80%	80%	90%	60%	80%
Data Management Systems	90%	40%	60%	70%	20%
Managing & Mitigating Risks	60%	20%	40%	40%	40%
Culture, People, Skills	20%	40%	80%	20%	40%
Leadership & Strategy	80%	20%	80%	70%	40%
Sustainability	90%	40%	60%	0%	80%
Finance	50%	40%	30%	40%	40%

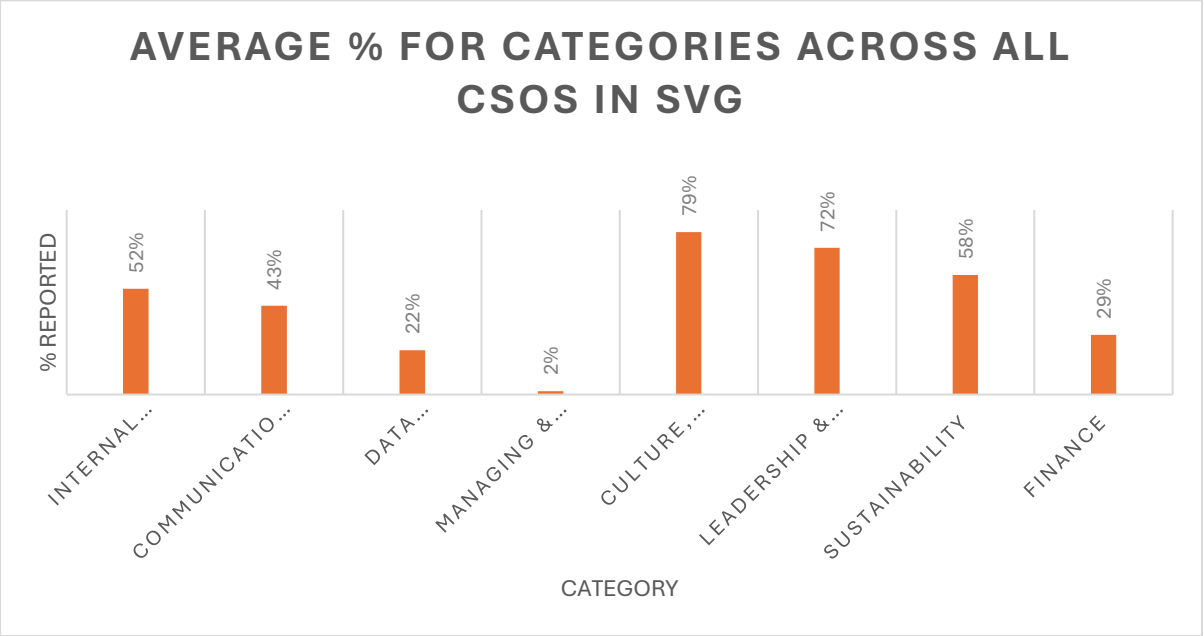
Table 2 Jamaican Self-Assessment Results



Graph 1 Jamaican Self-Assessment Results (Average % For Categories)

Assessment Category	CSO % Achievement- St Vincent and the Grenadines					
	1	2	3	4	5	6
Internal Systems	40%	60%	50%	85%	40%	35%
Communications, Website & Social Media	60%	20%	40%	50%	50%	40%
Data Management Systems	20%	10%	20%	20%	0%	60%
Managing & Mitigating Risks	0%	0%	0%	0%	0%	10%
Culture, People, Skills	80%	70%	80%	100%	65%	80%
Leadership & Strategy	80%	70%	80%	100%	80%	20%
Sustainability	50%	80%	60%	70%	70%	20%
Finance	40%	5%	20%	100%	0%	10%

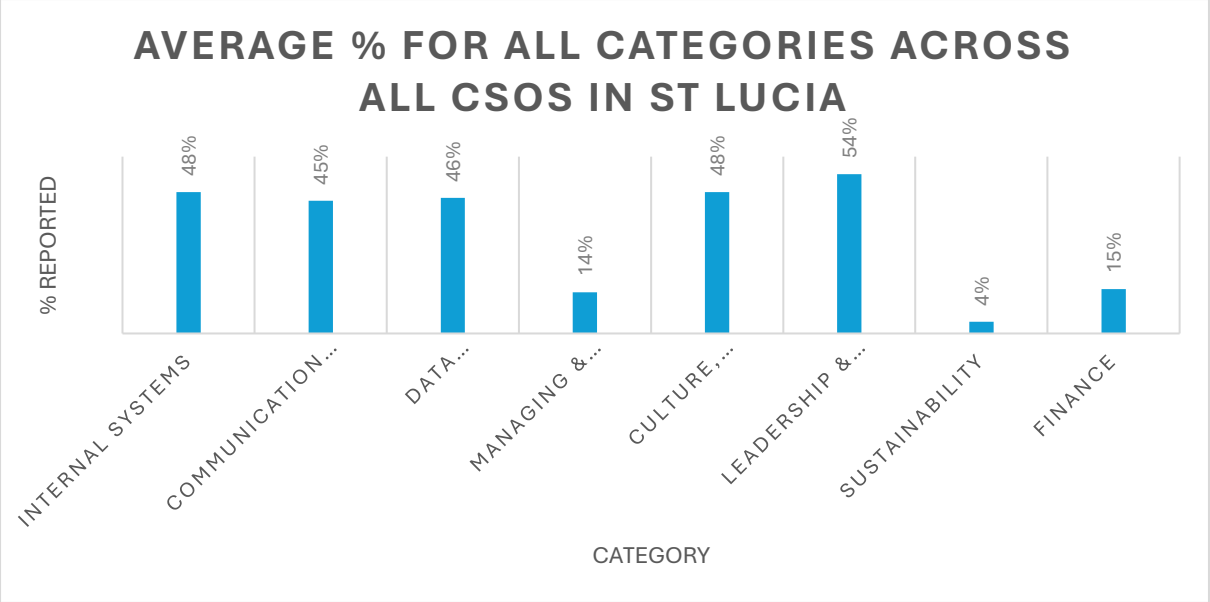
Table 3 St. Vincent and the Grenadines Self-Assessment Results



Graph 2 St. Vincent and the Grenadines Self-Assessment Results (Average % For Categories)

Assessment Category	CSO % Achievement – St Lucia				
	1	2	3	4	5
Internal Systems	20%	80%	60%	20%	60%
Communications, Website & Social Media	65%	60%	0%	40%	60%
Data Management Systems	60%	80%	30%	40%	20%
Managing & Mitigating Risks	30%	20%	0%	0%	20%
Culture, People, Skills	80%	60%	30%	30%	40%
Leadership & Strategy	40%	80%	70%	60%	20%
Sustainability	0%	0%	0%	0%	20%
Finance	10%	20%	15%	10%	20%

Table 4 St. Lucia Self-Assessment Results



Graph 3 St. Lucia Self-Assessment Results (Average % For Categories)

The following table represents the averages of the above figures and show which categories respondents thought were the strongest (most % achieved) and the weakest (lowest % achieved.) There was a wide variation in results and participants were asked to respond based on their own perceptions, which is highly subjective (with participants in the same organisations having varying results) and influenced by factors such as their position in the organisation (for example, entry level/volunteer versus senior staff) and familiarity with the organisation's day-to-day operations and backend systems.

Average Achievement by %	**Jamaica**	**St Vincent and the Grenadines**	**St Lucia**
Highest % achievement (across all CSOs for that country)	Communications, Website and Social Media (78%)	Culture, People and Skills (79%)	Leadership and Strategy (54%)
Lowest % achievement	Managing and Mitigating Risks, Culture, People and Skills and Finance (3-way tie at 40% each)	Managing and Mitigating Risks (2%)	Sustainability (4%)

Table 5 Showing Summarised Results of Wheel Exercise

These results show that overall participants in Jamaica self-scored the highest, while participants in Saint Lucia reported the lowest average self-scores, indicating a lower perceived level of technological maturity and readiness for adopting data science tools and emerging technologies.

In Jamaica, participants were asked to list and vote on the key challenges that they believe CSOs face and the following results were recorded.

- Lack of cooperative systems between agencies - 2 votes
- Inadequate enforcement of protected area policies - 3 votes
- High staff turnover undermining training investments - 3 votes
- Limited funding access for grassroots and conservation CSOs - 4 votes
- Economic priorities overshadowing environmental objectives - 4 votes

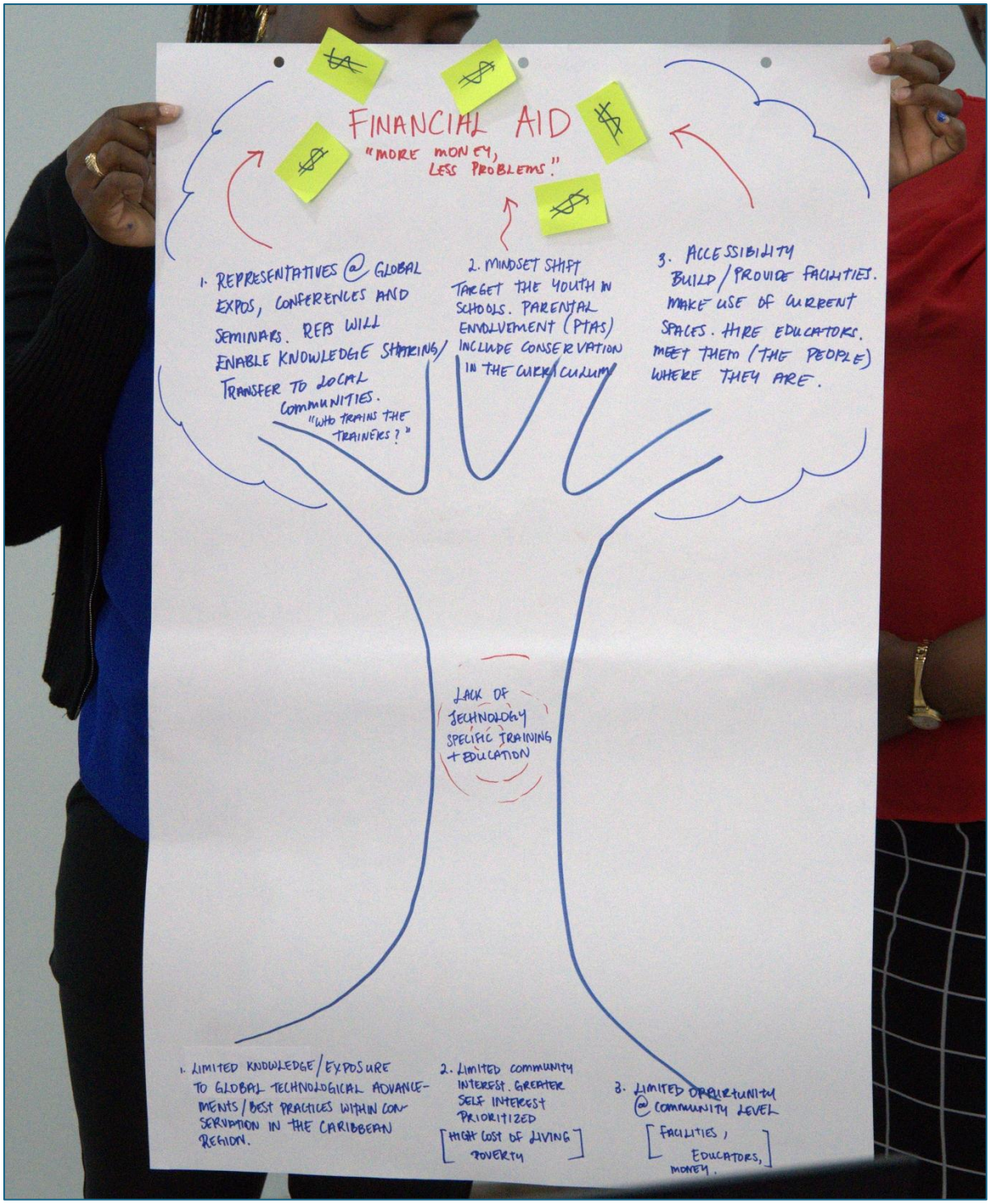


Image 6 Showing Jamaica Participants Problem Tree Analysis

The top votes relate to funding and wider national economics, and this is reflected in the self-assessment as finance was a category that was given a low average score. One organisation who self-scored 40% for finance indicated that they had limited internal capacity to track and manage grant funding independently and that a reliance on external financial assistance hinders flexibility and scalability.

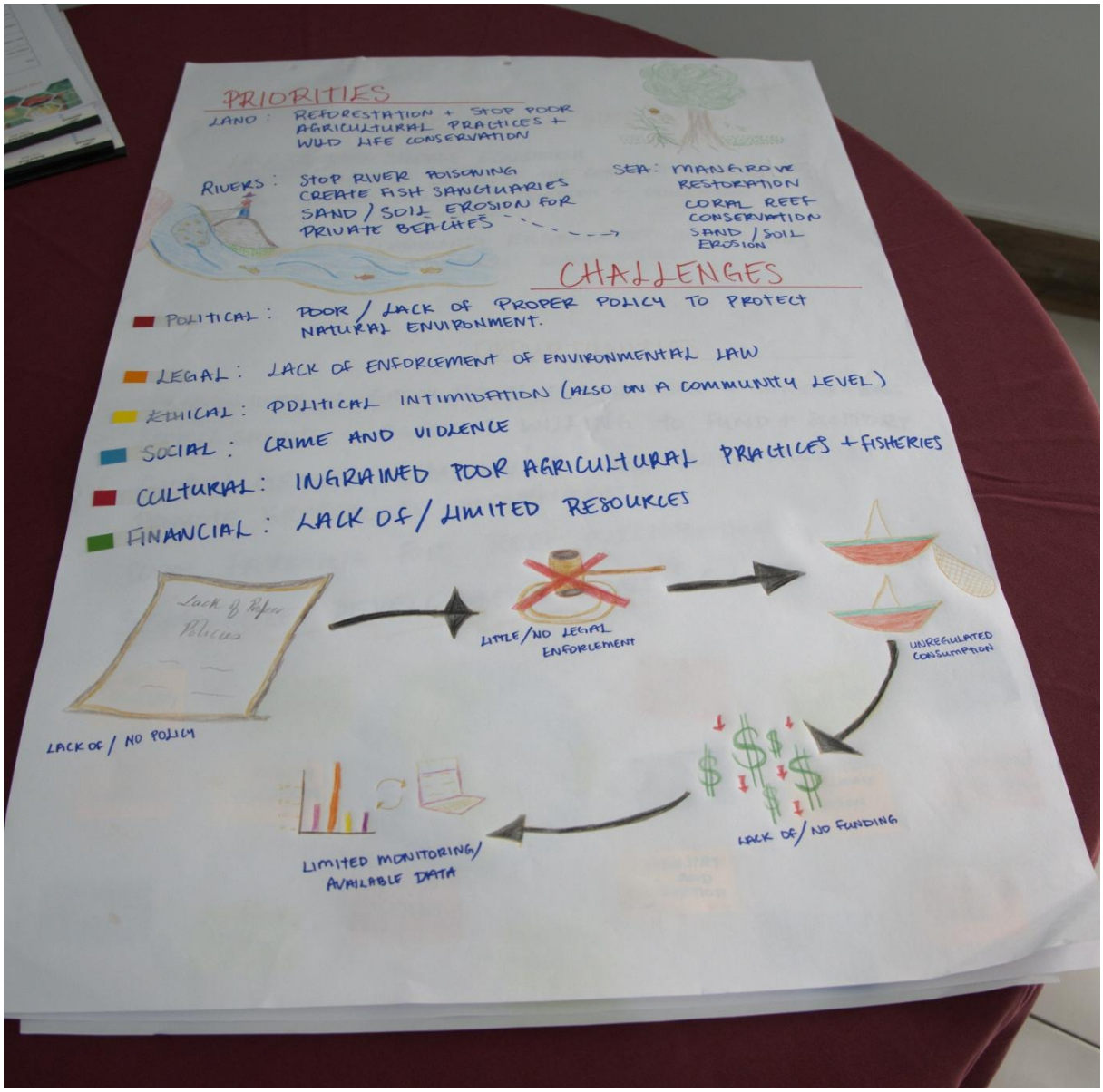


Image 7 Showing Challenges for Conservation-based CSOs in Jamaica (Participant notes)

Additional low scores were given in areas of managing and mitigating risks, and culture people and skills. One organisation indicated that internal staff are still catching up with new digital tools, particularly older team members and that digital culture is not yet embedded in their daily operations which led to a low score for culture, people, and skills. Another organisation responded to the managing and mitigating risks by sharing concerns around data protection, cybersecurity, and natural disaster preparedness, stating they have informal practices but no formal risk framework.

For Jamaica the highest scores (indicating the category that most organisations felt that they had achieved a high level of maturity in) were for communications, website and

social media and one organisation shared that they have a strong communications presence, especially on social media, and regularly update their audiences. Their visibility is a notable key strength.

In St Lucia, participants self-assessment showed the highest scores (best indication of maturity and readiness) for the category of Leadership, and the worst scores for Sustainability. Many organizations admitted that sustainability is not yet a major focus but should be prioritized moving forward and that education and upskilling on the proper use and maintenance of hardware and digital assets are essential. The group suggested that group meetings can be used to explore sustainable technological practices (including adopting energy-efficient systems, cloud storage solutions, or paperless workflows) and that establishing next steps and clear projections for upcoming activities ensures that sustainability efforts are actionable and measurable. In St. Lucia, *The Caribbean Digital Transformation project (CARDTP)* and the Government of St. Lucia have published an e-waste management plan which outlines that the e-waste management of the island is developing slowly, with some legislature addressing this and a few providers offering this service via exporting e-waste to other countries for recycling. Since the publication of that plan, other local providers have emerged, including Massy Stores conducting an e-waste collection and recycling drive (*Massy Stores Ltd, 2020.)*

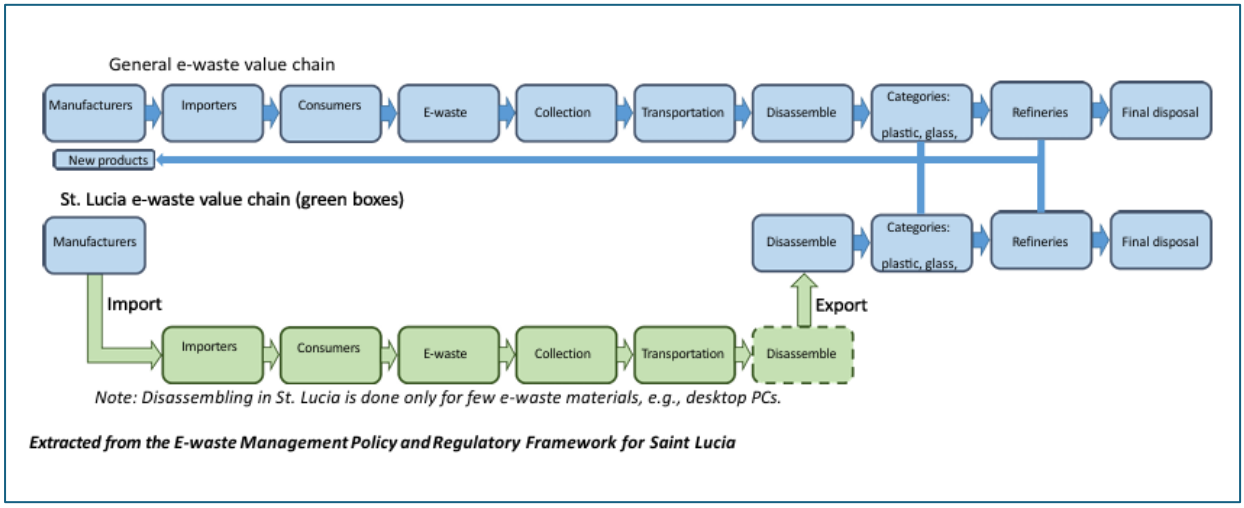
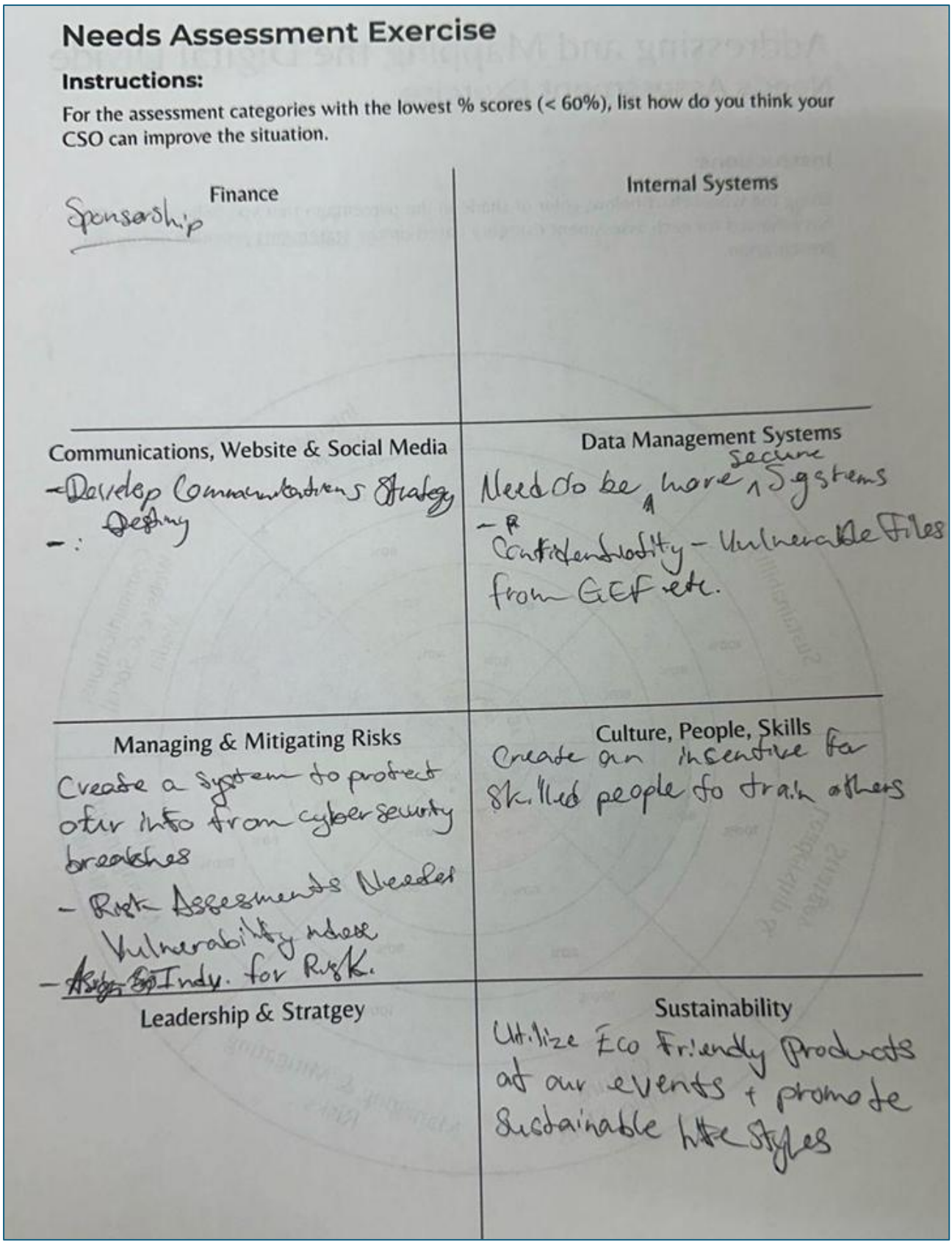


Image 8 showing St Lucia E-Waste Management Policy and Regulatory Framework Reference - https://www.govt.lc/media.govt.lc/www/resources/publications/cardtp-e-waste-management-plan.pdf



Needs Assessment Exercise

Instructions:

For the assessment categories with the lowest % scores (< 60%), list how do you think your CSO can improve the situation.

Finance

Sponsorship

Internal Systems

Communications, Website & Social Media

- Develop Communications Strategy
- Destiny

Data Management Systems

Need to be more secure Systems

- Confidentiality - Vulnerable files from GEF etc.

Managing & Mitigating Risks

Create a system to protect our info from cyber security breaches

- Risk Assessments Needed Vulnerability Index
- ~~Risk Ind~~ Indy. for Risk.

Culture, People, Skills

Create an incentive for skilled people to train others

Leadership & Stratgey

Sustainability

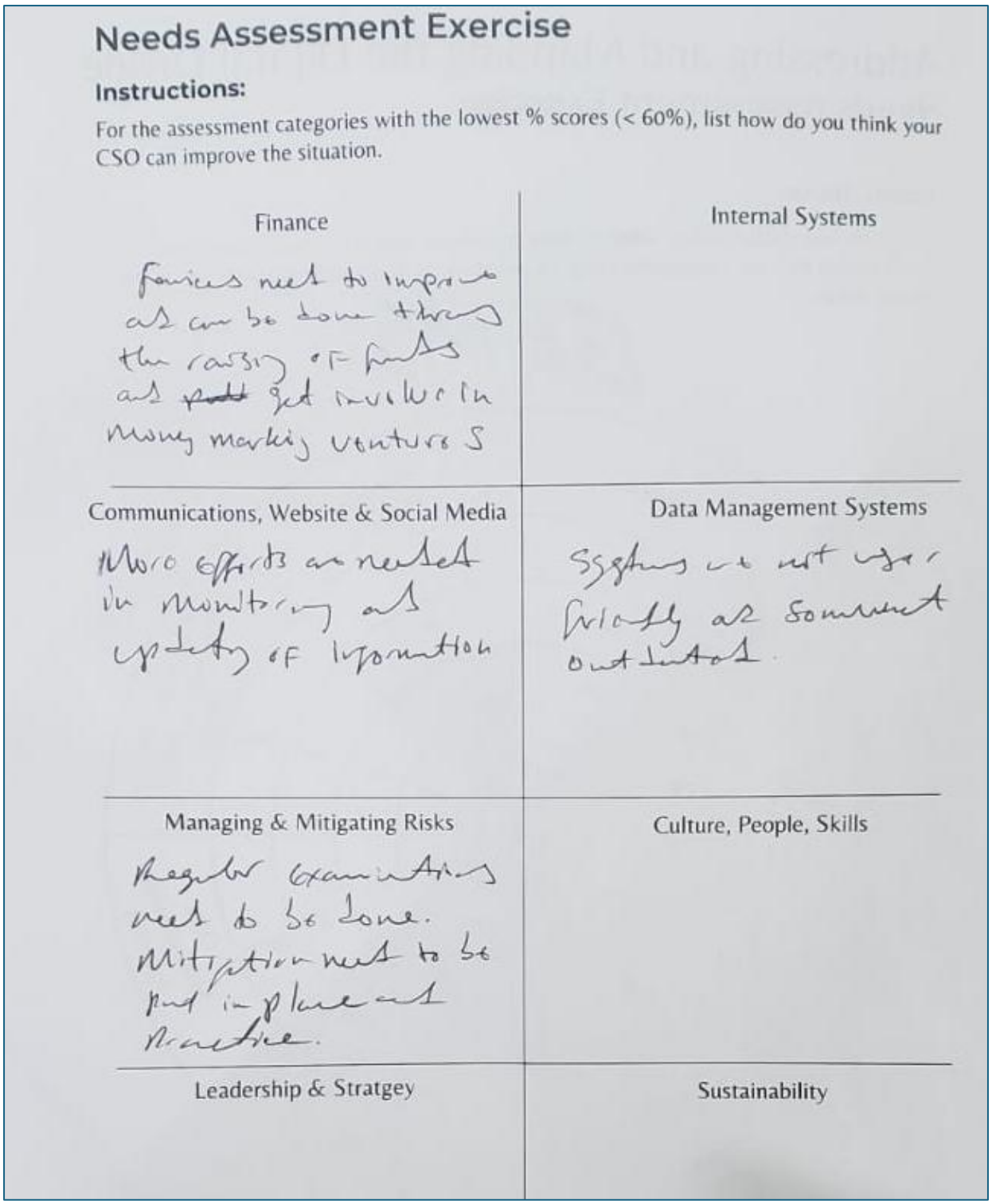
Utilize Eco Friendly Products at our events + promote Sustainable life Styles

Image 9 from St Lucian Participant with Suggestions to Improve Low Scores

For participants in St. Vincent and the Grenadines, their top self-assessed category was culture, people and skills, and their lowest scores were for managing and mitigating risks. The majority of CSOs gave the category for mitigating and managing risks a score of 0% which represent a significant gap for civil society in that island. Cybersecurity and risk management for identifying and monitoring data breaches represents an area for capacity building.

There were also low scores for the category of communications, social media and website and some participant suggestions for improvement were as follows:-

- More effort towards monitoring and maintaining
- Consistent in content creation
- Greater use of social media and email
- Funding for social media and marketing teams



Needs Assessment Exercise

Instructions:

For the assessment categories with the lowest % scores (< 60%), list how do you think your CSO can improve the situation.

Finance	Internal Systems
finances need to improve as can be done through the raising of funds as ~~pubt~~ get involve in money making ventures S	
Communications, Website & Social Media	**Data Management Systems**
More efforts are needed in monitoring and updating of information	Systems are not user friendly as comment outlined.
Managing & Mitigating Risks	**Culture, People, Skills**
Regular examinations need to be done. Mitigation need to be put in place and practice.	
Leadership & Stratgey	**Sustainability**

Image 10 Showing Needs Assessment Suggestions for St Vincent and the Grenadines

4.0 Key Needs (Country Specific) and Priorities for Action

Participants across the islands identified various priorities for conservation. In St Vincent and the Grenadines, the following were outlined by participants-

- Table Rock, a giant rock formed by volcanic eruption and a tourist attraction, is affected by the toxic runoff of chemicals from neighboring farms
- Need to boost coastal protection
- Mangroves were destroyed during hurricane Beryl (2024) and have not yet recovered
- Coral reef bleaching and restoration
- Beaches are disappearing due to sand being used for construction by private citizens and the government. Two beaches noted for disappearing are the famous Indian Bay Beach and Canash Beach
- Quarrying on the leeward side of the island has caused great destruction to rivers and the wildlife in surrounding areas
- Invasive species like lionfish, the African slug, and Asian flies are affecting the island greatly and destroying the agriculture and fishing sector
- Waterways are being degraded due to pollution and land degradation from poor agricultural practices, such as the disposing of agricultural products in water ways
- Conservation of marine life particularly whales due to overfishing and hunting. Pilot whales or “black fish” is a common delicacy in SVG and hunting them is part of a decades-old tradition. Participants discussed that spear fishing have been depleting fish e.g. rock fish. Fishers must now go further out to catch fish, with longer fishing times. There has also been the poisoning of rivers to catch fish.

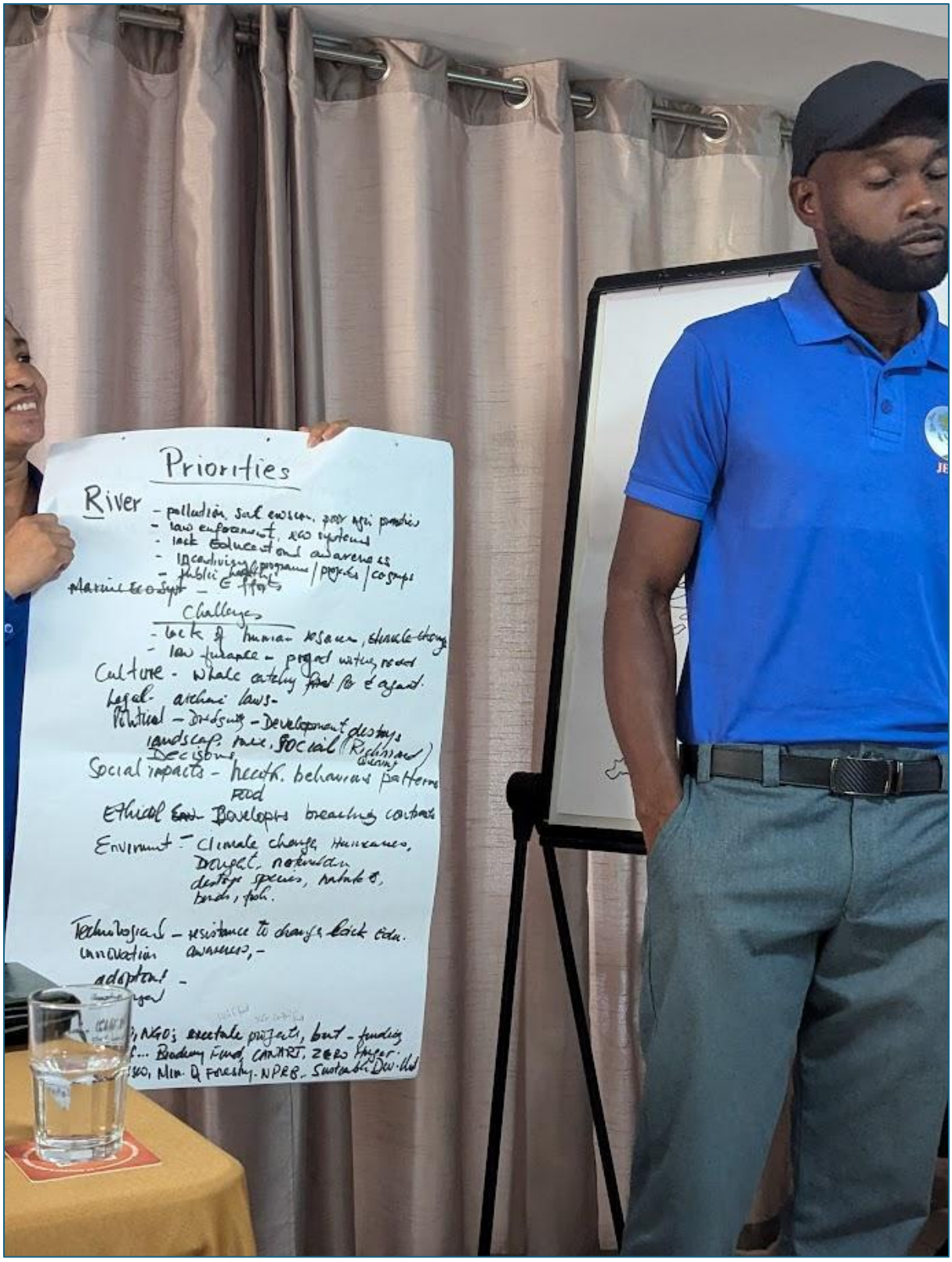


Image 11 Showing St Vincent and the Grenadines Participants Discussing Priorities for Conservation

In Jamaica, there was a similar focus on the marine and coastal environments, as participants noted that in marine spaces, Jamaica's goal to protect 30% of its marine areas emerged as a key driver of policy and programming. Stakeholders recognized the urgency to manage fishery practices more sustainably, enhance mangrove and coral reef restoration, and promote ethical tourism. However, these actions depend heavily on sound management plans and stronger monitoring frameworks. For terrestrial environments, the focus was on species-level protections and preventing habitat degradation through reforestation and improved land-use practices. Across both systems, participants emphasized the need for better data to support decision-making and for conservation literacy to be embedded in both formal education and community training.

In St Lucia, participants identified the following priorities:

- Sustained communication and advocacy drive to build awareness and consensus around conservation (public, private, civic.) Sustained public awareness campaigns are necessary to create a culture of conservation among communities, businesses, and policymakers
- Strengthen existing conservation policy to align with global standards and sustainable development goals. This includes legislation on conservation enforcement, including turtle fisheries. Conservation policies must align with international best practices and the United Nations Sustainable Development Goals (SDGs) to enhance environmental sustainability
- Land use policy and incentivizing the “built environment” (requiring all building projects to have regulation on use of equipment, re-enforcement of license renewals for large scale equipment)
- Put in place a coordination framework/ mechanism for private and public stakeholders to work towards common issues on conservation
- Robust data collection and analysis to inform research and development. Improved data collection and analysis across sectors, including fisheries, agriculture, forestry, and CSOs, is essential for evidence-based decision-making and strategic planning
- Increasing budget allocations towards conservation efforts. Implementing modern data management tools and GIS mapping technologies could provide better insights for conservation efforts

Common priorities across all islands for conservation efforts include improving legal and regulatory protection for key ecosystems and species, reducing habitat loss and deforestation, and reducing the impacts of climate change and anthropogenic harm on the environment. Improving enforcement of existing laws, policies and regulations by dedicating more resources to these sectors was mentioned by various participants.

Other studies have shown similar results and highlight that despite regional and national policies existing which support conservation efforts, there are often additional barriers to successful implementation of these policies, including lack of financing, lack of data and information, insufficient resources and capacity and lack of integration of biodiversity protection into other sectors (*IUCN, 2025*)

Equipping CSOs with the resources and funding to perform their operations was also a priority. These priorities were often aligned with the strategic directions and investment priorities of CEPF, highlighting the common themes for conservation across the region and globally, such as protected area management, ecosystem resilience and safeguarding critical species and landscapes. The priorities also reflected the challenges, barriers and constraints identified by participants, as the priorities often sought to dismantle or address these challenges.

Previous studies in other regions have addressed the key barriers and constraints to conservation technology, including one which surveyed 101 practitioners, researchers and technologists and highlighted factors such as high costs, high knowledge barriers and the limited adaptability of "off-the-shelf" products. The limitations of durability, energy/power management/efficiency, interoperability and other factors have led to some bottom-up development of bespoke products, tools and services for conservation needs, but progress is not optimal. The main emerging needs highlighted were the need for automated processing of data streams and the improvement/customisation of existing market-ready tools and devices. The authors of that study recommend that "*for technology-based solutions to have substantial conservation impacts, there is a need for collaborations that effectively identify feature needs, share data, and facilitate iterative development and support*" and the collaboration and communication amongst actors, including developers and end-users, be improved (*Hahn et al, 2022.)*

Other authors have also reiterated that most of the technologies used by conservationists were not originally designed with conservation as the intended use, but rather adopted and modified from other fields, such as the military (Berger-Tal, 2018.) This argument that conservationists should move from being technology consumers to the drivers and innovators of technology was also mentioned by participants in workshops when discussing the need for regional-specific innovation to be fostered.

A study in 2024, which involved in a systematic review of over 200 articles between 2015 and 2023, also recommended that "*interdisciplinary collaboration*" and "*inclusive governance models*" are important to ensure that technology can be successfully integrated into conservation efforts. In this paper, there was a call for "*cultivating partnerships*" and an emphasis on addressing "*socio-economic obstacles*" to ensure sustainable and equitable outcomes, and this is very similar to the opinions of the participants in the target islands of our study (*Khabibullaev, 2024*)

5.0 Opportunities

Participants were asked to discuss the opportunities for conservation and conservation technologies within their CSOs, and countries and the following results were reported.

5.1 Jamaica

- Participants agreed that education and cultural engagement must be at the heart of any solution. Embedding conservation into school curricula, engaging parent-teacher associations, and using creative social media platforms were proposed as ways to connect with youth and families. Regional exchange programmes were also proposed, where practitioners from one island could intern or learn directly from others.
- Creating shared technology pools and improving interoperability across systems could reduce duplication and support more efficient collaboration.
- Opportunities also exist through aligning projects with global frameworks such as the Sustainable Development Goals (SDGs), which can increase access to funding.

Jamaica has both an ICT policy and an ICT sector plan, and the National Development Plan of Jamaica outlines that a "*technology-enabled society*" is a desired national outcome. The sector plan (2009-2030) includes a situational analysis of the sector including policy and frameworks which govern the sector and a review of various education and training opportunities available to citizens at secondary and tertiary institutions. It also highlights "*ICT for development*" initiatives in different sectors, including agriculture. It outlines opportunities in the SWOT analysis (strengths, weaknesses, opportunities, threats) and includes those which can support civil society such as: -

- E-inclusion and the presence of competitive businesses/vendors in the ICT sector
- Education and training available to students
- Opportunities for increasing readiness and infrastructure as upgrade pathways exist
- Research and innovation via collaborations (*Jamaica ICT Sector Plan 2009*)

5.2 St. Lucia

- Heightened global awareness of climate change, when linked to conservation, may be used to secure funds and can act as the motivation to make policies, laws and other opportunities for conservation awareness and efforts

- CARICOM can focus on their own conservation agenda to fill the gap and become more independent of foreign aid
- Funding mechanisms such as the Global Climate Fund (GCF), Global Environmental Facility (GEF), and the Saint Lucia Conservation Fund (SLUCF) offer opportunities for financing conservation projects
- Partnerships with international conservation agencies, research institutions, and NGOs can support knowledge-sharing, resource mobilization, and technical training
- Digital platforms can be used for educational campaigns, community engagement, and advocacy
- Creative storytelling, performances, and visual arts can be powerful tools for raising awareness and mobilizing public support for conservation initiatives.

St. Lucia has a National ICT Policy and Strategy 2013-2018 which is still used to guide decision-making and though there is no specific mention of conservation or the environment as a focal point, there can be synergies with other target sectors. As a member of Caribbean Digital Transformation Project (CARDTP) of the Organisation of Eastern Caribbean States (OECS) there are additional opportunities for St. Lucia to transform and create pathways for digital inclusion (*ECLAC, 2024*).

5.3 St. Vincent and the Grenadines

- There are several Civil Society Organizations (CSOs) that are engaged in various conservation projects, enhancing community involvement and awareness
- Potential funding can be accessed by organizations such as the Global Environment Facility (GEF) which support environmental initiatives
- The Forestry Department, under the Ministry of Sustainable Development, has recently begun to focus on maintaining national parks, indicating an increased governmental commitment to conservation
- The Ministry of Sustainable Development has secured new funding, allowing for the initiation of projects. However, there is a need to increase collaboration with CSOs and environmental groups to maximize impact.
- Local businesses and schools are participating in beach clean-ups, though they have limited involvement in providing funding or resources for environmental initiatives.
- There is a growing trend in other countries towards adopting recycling, reuse, and circular economy innovations in the building industry, which could be effectively integrated into St. Vincent and the Grenadines.
- SVG has a privately-owned recycling facility focused on plastic bottles. While some supermarkets have eliminated plastic bags and Styrofoam, there has been

a recent trend of some returning to offering plastic bags for a fee. This presents an opportunity to strengthen recycling initiatives and promote sustainable practices.

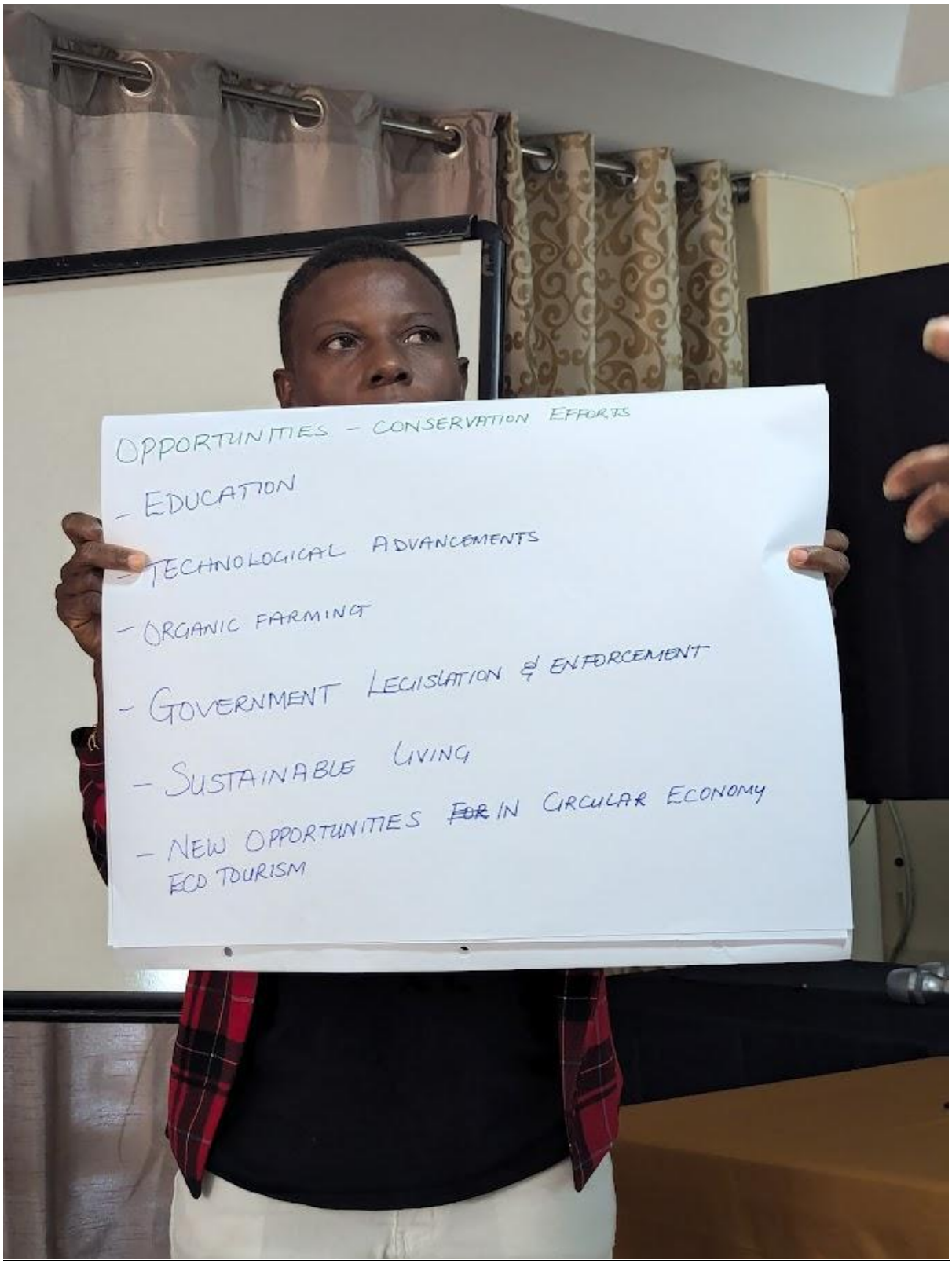


Image 13 St. Vincent and the Grenadines Opportunities Presented by Participant

The Cropper Foundation, 2026

St. Vincent and the Grenadines is also a participant in the CARDTP, and this can present opportunities for digital transformation and inclusion.

The opportunities presented by participants across all islands focus on various themes such as funding acquisition, creating networking and collaborative systems amongst various actors and utilising social trends such as social media to further conservation efforts. These are similar to opportunities noted in other regions surveyed during the *Speaker et al* study where focus groups of 45 leading experts were conducted, which also mentioned the establishment of a sustainably funded convening body as one opportunity for conservation technology to advance globally (*Speaker et al 2022*.)

TABLE 2 Most frequently mentioned opportunities for advancing the field of conservation technology identified by participants across 7 technology-specific focus group discussions

Theme	Definition	Total mentions	Occurrence across focus groups (%)
Collaboration & information sharing	Improving how actors in the field work together	43	100
Interoperability	Improving how tools and data streams can be used in concert	32	100
Data analysis	Expanding capacity for analysis of data being collected	30	100
Bespoke tools	Developing fit-for-purpose conservation technologies	28	86
Data sharing	Increasing capacity to share, store, and collate data globally	25	86
Data collection	Increasing capacity to collect data more efficiently and at larger scales	24	86
Local capacity building	Investing in technical capacity and training of local partners	20	86
Ease of use	Making tools more accessible and user friendly	19	100

Image 14 Most frequently mentioned opportunities for advancing the field of conservation technology identified by participants across 7 technology-specific focus group discussions. Reference: - *Speaker et al, 2022*

As outlined by Khabibullaev in 2024, the use of participatory engagement platforms and social media is important for raising awareness of issues, fostering transparency and promoting inclusivity in conservation and this represents an important opportunity for civil society to harness. Other opportunities such as increasing private/public partnerships and using Corporate Responsibility initiatives can be explored to increase funding for projects and operational costs. Academic-conservation partnerships can also prove useful for improved dataflows and collaborations. Importantly, Khabibullaev noted that technological advancements must be considerate of valuable existing traditional and local knowledge and preserve and integrate this knowledge where possible (*Khabibullaev, 2024*).

It is important to note that broadly across the Caribbean, many of the opportunities and focus of digital transformation is seemingly focused on the Government and public sector of the countries, with fewer opportunities, initiatives and investment in civil

society (*ECLAC, 2024.)* Whilst participants may have indicated that they were not aware of certain opportunities such as training and upskilling, and desktop research indicates that these do exist, it can be suggested that opportunities are not widespread, easily accessible or affordable, not reaching the target populations efficiently or not advertised/marketed effectively. This emphasises that digital inclusion is not being achieved in these islands.

5.4 Stakeholder Mapping - Database of Key Actors

The participants were asked to complete a mapping exercise where they documented who they believed were individuals, organisations and institutions which could provide support to create an enabling and supporting environment for digital transformation and inclusion of data science and technology for their countries. The following tables represent these contributions and are representative of the opinions of the participants.

Service Providers (Vendors)	Government Institutions/ Agencies	Civil Society Organisations	Mentors (Experts)
JAMAICA			
DIGICEL FLOW MICROSOFT CARIBBEAN National Water Commission Jamaica Public Service	National Environment and Planning Agency (NEPA) National Solid Waste Management Authority (NSWMA) Jamaica National Heritage Trust Water Resource Authority National Commission on Science and Technology (NCST) Scientific Research Council (SRC) Forestry and Fisheries Division	Jamaica Climate Change Youth Council (JCCYC) Jamaica Environment Trust (JET) Montego Bay Marine Park Trust (MBMPT) Oracabessa Marine Trust Northern Cockpit Country Trust Jamaica Conservation and Development Trust (JCDT) Rio Grande Maroon Heritage Foundation Jamaica Heritage Trust BirdLife Jamaica BirdsCaribbean CANARI (Caribbean Natural Resources Institute)	University of Technology, Jamaica (UTech) Caribbean Maritime University (CMU) Northern Caribbean University (NCU) The University of the West Indies (UWI) The HEART/NSTA Trust
ST. LUCIA			
Water and Sewage Company Ltd. (WASCO) Saint Lucia Electrical Services Ltd. (LUCELEC) Digicel Flow Computer World Computer & Business Services The Cell Rayneau Construction & Industrial Services	Ministry of Sustainable Development, Energy, Science and Technology Government Information Services Bureau of STATS – Central Stats Office Ministry of Finance DigiGov Platform Youth Economy Agency Saint Lucia TVET Institute Sir Arthur Lewis Community College	Caribbean Youth Environment Network Helen's Daughters Soufriere Marine Management Association Aupicon Agri Seamoss Producers Group Saint Lucia National Conservation Fund Saint Lucia National Trust	Albert Daniels, ICT Senior Manager, Stakeholder Engagement, ICANN Global Stakeholder Shergaun Roserie and Keeghan Patrick, Co Founders of Obtronics Ltd. Agriculture Officers of the Ministry of Agriculture, Saint Lucia Cooperatives: Fishermen / Farmers Dr. Jimmy Fletcher
ST. VINCENT AND THE GRENADINES			
FLOW DIGICEL MAVCOM OSV Research Innovate Lifstyle The National Telecommunications Regulatory Commission (NTRC)	Sustainable Development Unit – Janeel Miller NTRC – Apollo Nights NCTI – Petrus Gumbs ITSD – Information Communication Sector for Development Forestry Department Ministry of Agriculture Ministry of Tourism Central Water and Sewerage Authority (CWSA)	JEMS Energize Earth SVG LA BIOCHEM Richmond Vale Academy Greenhouse Lab We are Mayreac Inc ULEDO SVG Environmental Fund	JEMS – Dr. Andrew Simmons Dr. Reynold Murray Louise Mithcell Richmond Vale Academy

Table 6 of Database of Key Actors

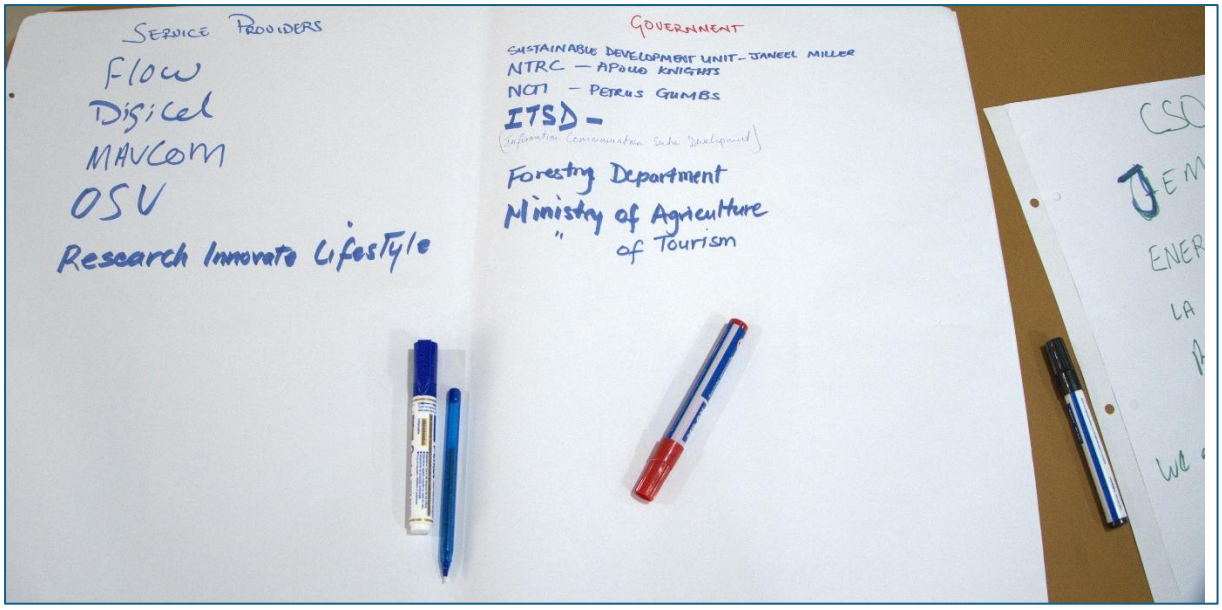


Image 15 Participants' notes for database of key actors in St. Vincent and the Grenadines

6.0 Recommendations

1. Scale up and refine the needs assessment tool piloted through this project and develop a version that can be made publicly available to CSOs across the Caribbean.
2. Use the weakest scoring categories identified in each country to design targeted interventions, with an initial focus on foundational gaps such as risk management and cybersecurity, financing for technology adoption, and data management systems.
3. Develop and validate an expanded database of actors (individuals, private sector entities, academic institutions, governmental agencies, and regional organisations) that can function as a distributed support system for technology adoption and digital inclusion.
   Guidance for this recommendation can be drawn from:
   Mohammed et al. (2022), "Data4Good: An Established Framework for Supporting Civil Society Organizations.

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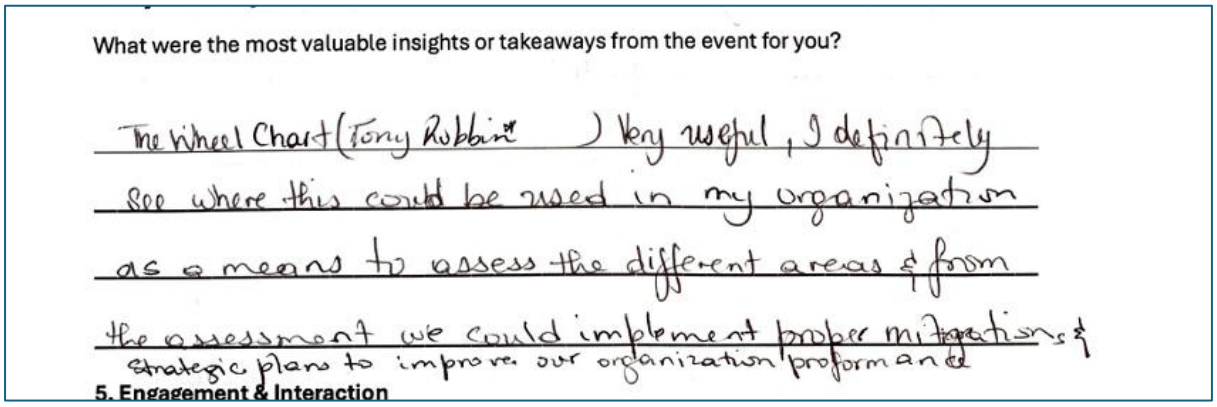
Appendix 1- Feedback

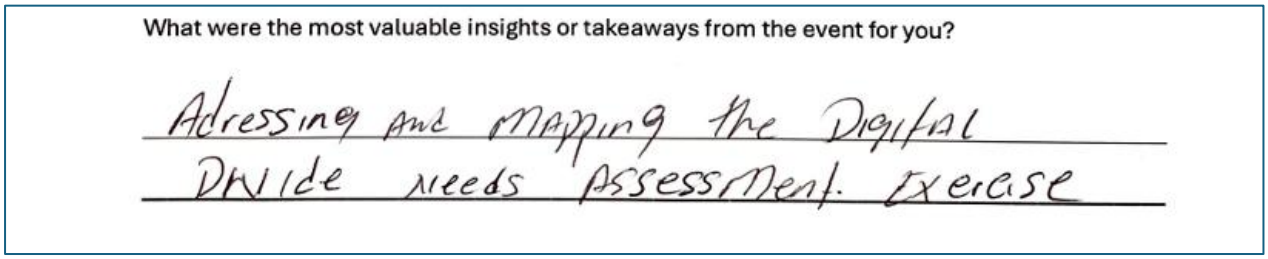
The feedback for this activity was overall positive with participants expressing an interest to use this idea for future activities within their own organisations, and some participants requesting extra handouts of the wheel template to distribute to their CSOs. This activity provided an opportunity for introspection and evaluation beyond most CSOs regular reporting and performance indicators.


What were the most valuable insights or takeaways from the event for you?

The Wheel Chart (Tony Robbins) Very useful, I definitely see where this could be used in my organization as a means to assess the different areas & from the assessment we could implement proper mitigations & strategic plans to improve our organization proformance

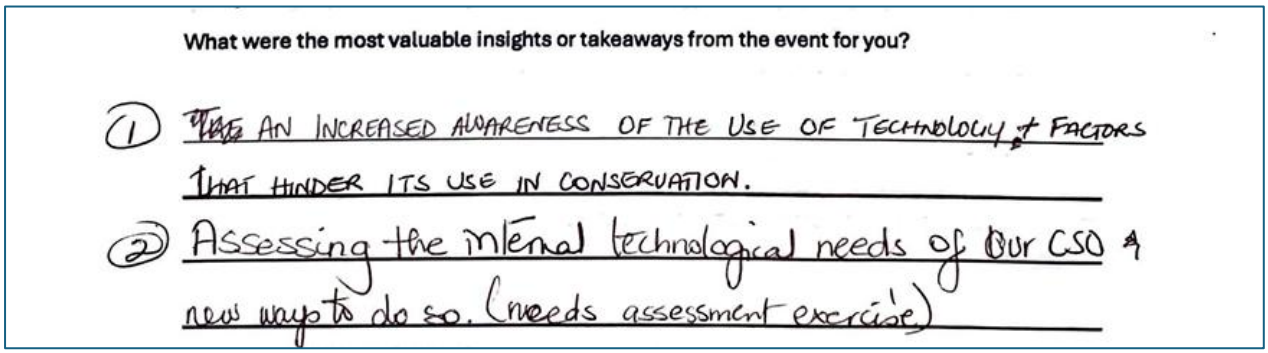
5. Engagement & Interaction

Image 16- Feedback from Jamaican Participant


What were the most valuable insights or takeaways from the event for you?

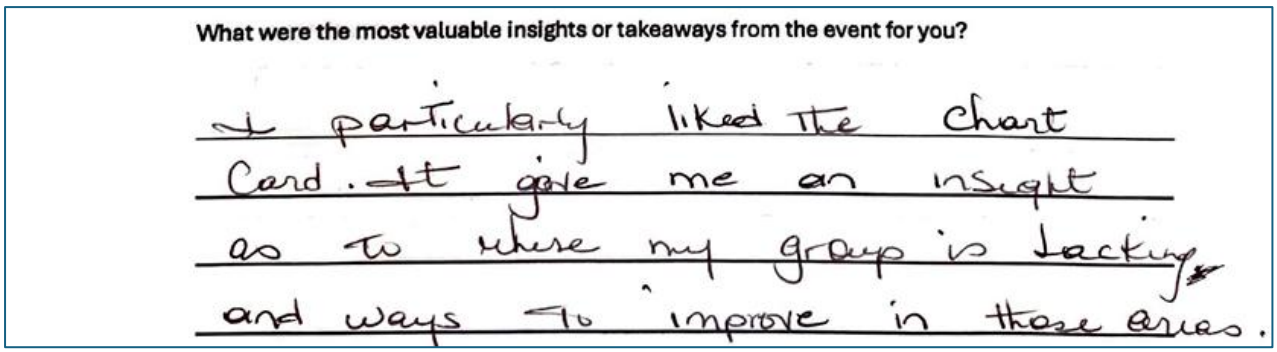
Adressing and mapping the Digital Divide needs Assessment. Exercise

Image 17- Feedback from St. Lucian Participant


What were the most valuable insights or takeaways from the event for you?

(1) AN INCREASED AWARENESS OF THE USE OF TECHNOLOGY & FACTORS THAT HINDER ITS USE IN CONSERVATION.

(2) Assessing the internal technological needs of our CSO & new ways to do so. (needs assessment exercise)



Images 18 and 19- Feedback from St. Vincent and the Grenadines Participants