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Adaptation, Official Development Assistance, and Institution Building: The Case of the Caribbean Community Climate Change Centre

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Abstract: The Caribbean Community Climate Change Centre was launched in 2005, culminating a process that included three precursor projects: Caribbean Planning for Adaptation to Climate Change (1997–2001); Adapting to Climate Change in the Caribbean (2001–2004); and Mainstreaming Climate Change (2003–2009). Each benefited from multiple sources of official development assistance (ODA), clearly defined tasks, and leadership from the region’s scientific and technical communities. Shared goals and principles across the projects included: use of bottom-up participatory methods; building the technical capacity of national and regional institutions; mainstreaming adaptation in economic development programs; and partnering with governmental, non-governmental, and private sector organizations. This article applies concepts from the global environmental politics literature on interplay, environmental policy integration, and regional governance to trace the institutionalization of the Centre. Fifteen semi-structured interviews and reviews of project documents reveal how the Centre built capacity to plan and manage projects, act as a regional hub for technical support and data, participate in the multi-level political interplay required to secure ODA, while exploring other funding sources; and the extent to which it has been able to maintain its commitment to bottom-up, participatory methods, effective internal and external communications, social assessment, and monitoring and evaluation of projects.

Keywords: climate change adaptation; environmental policy integration; regional environmental governance; Caribbean; small-island developing states; mainstreaming; institutionalization

1. Introduction

The Caribbean Community Climate Change Centre is the product of externally funded but locally driven programs for building adaptive capacity in Caribbean Community member-states (CARICOM). The Centre opened in 2005, culminating a multi-stage process involving interplay at the local, national, regional, and international levels of climate governance. Each stage was defined by a precursor project—Caribbean Planning for Adaptation to Climate Change (CPACC, 1997–2001); Adapting to Climate Change in the Caribbean (ACCC, 2001–4); and Mainstreaming Adaptation to Climate Change (MACC, 2003–9)—that had its own funding stream from governmental, intergovernmental and non-governmental organizations, and its own prescribed timeframe for disbursement of funds and completion of tasks. Yet, there was a coherence to the process that—despite a great deal of learning-by-doing and some unintended outcomes—built upon a consistent set of goals and principles.

The main goals of the Centre derive from an integrative vision of adaptation based on building scientific capacity for measuring and monitoring climate change impacts; mainstreaming climate change adaptation in economic development; and working with international organizations (IOs), governments, communities, and businesses. Project documents indicate a strategy of environmental policy integration (EPI), including bottom-up approaches to needs assessments; partnerships with

governments, regional organizations, non-governmental organizations (NGOs), community-based organizations (CBOs), universities, and businesses; and support mostly from official development assistance (ODA).

This article presents a case study of a regional organization as it builds the institutional capacity to mainstream climate change adaptation for a group of highly vulnerable developing countries. In it I evaluate the potential for success or failure based on the requirements of institutionalization, understood as the ability to overcome obstacles to mainstreaming, and to adapt to the demands of obtaining and maintaining funding and influence in complex global and regional political contexts. The literature on mainstreaming and EPI provides an important set of criteria. The literature on interplay and the role for regional organizations provides another. Ultimately, I will argue that the case of the Caribbean Community Climate Change Centre (hereafter the Centre, CCCCC, or 5Cs) contributes to the understanding of how a regional organization may manage interplay among various development assistance efforts in order to mainstream rather than compartmentalize climate change adaptation in a highly vulnerable, poor region. Furthermore, although the research does not directly address the political economy of development assistance, the particular role and position of the Centre in global environmental governance—as an agency of CARICOM—brings into focus two additional factors affecting the capacity to mainstream climate change adaptation: financing that includes a mix of ODA from various sources, and the complexities encountered by regional organizations attempting to influence policy and program implementation in sovereign states and disparate communities in the developing world.

This article begins with discussions of the concepts underlying the development and goals of the Centre (mainstreaming and EPI), of the challenges and opportunities presented by taking a regional approach to multiscale climate adaptation and governance, and of institutionalization. Next, I provide a brief history of the Centre's development through the implementation of the three aforementioned projects and descriptions of the Centre's current work and situation. The paper concludes with an assessment of how effectively the Centre has accessed and utilized external funding, compensated for the vulnerabilities associated with aid dependence and insufficient institutional capacity, how it has adapted as an institution while promoting climate change adaptation projects, and what its present portends for its future.

1.1. Mainstreaming and EPI

Dalal-Clayton and Bass define environmental mainstreaming as “the informed inclusion of relevant environmental concerns into the decisions of institutions that drive national, local and sectoral development policy, rules, plans, investment and action [1] (p. 11)”. “In Europe, such main-streaming has been referred to as Environmental Policy Integration as ‘moving environmental issues from the periphery to the centre of decision-making, whereby environmental issues are reflected in the very design and substance of sectoral policies’” [2] (p. 263). Calls for such integration in developing countries go back at least as far as Agenda 21, which recognizes the simultaneous and deleterious pressures that multiple economic sectors exert on the environment and the limited effectiveness of arrangements that make environmental protection the mandate of a single, dedicated institution of the state, such as an environmental ministry or department [2] (p. 264).

In CARICOM member states, the challenges that come from poverty and high levels of economic vulnerability are compounded by increasingly extreme and erratic weather, sea-level rise, coastal zone erosion, coral bleaching, biodiversity loss, land degradation, and drought. These environmental stressors can affect all major economic sectors—including agriculture, tourism, manufacturing, fisheries, forestry, and infrastructure—each of which may have its own, competing preferences for adaptive measures [3]. Therefore, in developing countries, environmental mainstreaming competes for the attention of policy-makers and access to limited resources in an atmosphere of contending yet interconnected policy challenges. Each scale of governance and each economic sector can have distinct needs in such key functions as managing trade-offs with other development goals and targets,

adjudicating disputes over decision-making authority, collecting and analyzing data, and procuring support (material and political). Dependence on ODA adds yet another dimension to the politics of these problems—the shifting interests and commitments of donors [2] (p. 264).

Persson analyzed the stress EPI places on institutions as a set of bureaucratic, technical, and administrative challenges that must be met in order to mainstream the environment in multiple policy arenas [4,5]. She listed four generic challenges: “complex and competing jurisdictions”, “a proliferation of policy goals”, “insufficient capacity and weak institutional structures”, and tensions between country- and sector-level initiatives and responsibilities [5] (pp. 411–415). In the “Discussion” (below) I revisit Persson’s four challenges to sum up the accomplishments and shortcomings of the Centre in building its own institutional capacity to mainstream climate change in CARICOM member states.

1.2. Regional Governance and the Environment

Much of the international relations literature on global environmental governance focuses on regimes, multilateral environmental agreements (MEAs), and large international organizations (IOs). While these can signify broad consensus on the importance of addressing climate change and even increase access to funding for adaptation, they are often dominated by states that, because they are major greenhouse gas producers, have a bias toward prevention and mitigation. But adaptive strategies, since they do not seek to address causation directly, present their own set of implementation problems, and small states will be more concerned with adaptation. Beset by diverse interests and competing perspectives regarding the urgency and desirability of different methods of adaptation, small states need to carefully assess local needs and capacity and cooperate in marshalling scarce resources to design and implement adaptive measures. Therefore, regional approaches carried out by smaller international organizations and led by individuals sensitive to the economics, politics, and cultures of their regions play critical roles [6]. Individuals and organizations with experience working at the international and national levels can connect different “capitals” and navigate the complex politics of their local socio-ecological systems to build adaptive capacity and find innovative ways to respond to multiple environmental stressors [7].

To understand the “vitality” of IOs, Gray argues that scholars need to look beyond the treaties that form them and their relationship to states, and explore the requisites of “bureaucratic capacity” [8] (p. 1). Factors such as agency, leadership, recruitment of personnel, institutional autonomy, and pragmatism contribute directly to organizational capacity and allow IOs to form partnerships across scales of governance, as well as with public, private, and civil society actors [9]. Qualitative research that puts scholars in conversation with practitioners adds to our understanding of how IOs build the bureaucratic capacity they need to navigate the political challenges of interplay, and of how interplay affects the development of organizations’ missions, methods, and sense of their own efficacy.

Regional organizations—those representing sovereign states in geographically defined areas—represent a subset of international organizations (IOs) whose potential for furthering the cause of environmental policy integration has received limited attention in the literature on global environmental governance. The Centre’s mandate, size, mode of operation, and its relationship to states and other IOs gives it characteristics of both a small IO and a local organization. Its current focus on regional projects with multiple local sites—often with multiple funders—puts a premium on its capacity for “facilitating external support for adaptation” and mediating “the influence of any external interventions on adaptation practices” [9] (p. 174). As Agrawal observed, such functions are typically carried out by local organizations and can be critical for adaptation in small, poor countries. He argues that local (or subnational) institutions, when effective, build “greater capacity to withstand climate variability” without having to foment basic structural change in local economies and systems of governance [9] (p. 176), in effect, working within, beneath, and above national politics.

The Centre, as a specialized agency of the principle IO of Caribbean states, has taken on the responsibility to mediate relationships between localities and the multiple external actors that provide

financing for development and other policy interventions. Thus, some insights from the study of IOs and local organizations pertain, and a study of the Centre may contribute to a better understanding of both local and international organizations seeking to build adaptive capacity in poor and heavily impacted regions [9] (p. 174).

Ivanova's analysis of the United Nations Environment Programme (UNEP) found that environmental IOs need to function as "anchor organizations" in order to manage the complex interplay inherent in environmental governance [10] (p. 45). Here, we see similarities between IOs and local institutions. For local institutions, the mediator's role requires "information, technology, funds, and leadership" [9] (p. 177), and "human capital in the form of training, skills, and knowledge; social capital in terms of relationships and institutional access; financial capital in terms of liquid and non-liquid assets; natural capital in terms of available natural resources" [9] (p. 177). For IOs to be effective as anchor organizations requires an institutional design that helps overcome fragmentation of authority and responsibility among large numbers of IOs and states, "well-developed communication infrastructures, a large supply of well-educated employees and easy access to constituencies, donors, and technologies" [10] (p. 48). Sforna [11] noted an increased influence of developing countries in negotiating assistance for adaptation and compensation for the impacts of climate change. She saw a progression from the diffuse and underfunded gains made through the Kyoto Protocol's Annex I/Annex II classification scheme and the Clean Development Mechanism, to the establishment of the Green Climate Fund (GCF) and the assertion of concerns common to developing countries in their Nationally Determined Contributions (NDCs) under the Paris Agreement. These concerns include the adaptive measures most directly related to the threats of greatest ecological and economic importance to the Caribbean region, and to small island developing states (SIDS) more generally [11] (pp. 288–289).

Corbett et al. argue that the crosscutting impacts of climate change on SIDS gives them an intensity of interest in international decision-making *fora* and a basis for forming alliances across economic sectors that might otherwise be policy competitors. This, they argue, is a necessity for countries with weak, poorly funded, and overstretched diplomatic resources. Therefore, such recent developments as Fiji's presidency of the United National Framework Convention Conference of the Parties (UNFCCC COP) 23 and the more active and coordinated role played by the Association of Small Island States (AOSIS) in the UN represent small but necessary steps in the right direction [12] (pp. 103–104).

In light of the shortcomings of MEAs for meeting the specific and immediate needs of small states, effective *regional* governance may be a necessary condition for effective *environmental* governance in the Caribbean and other highly vulnerable regions [13]. Regional initiatives may benefit from established relationships among states, organizations, business, and communities; specialized knowledge of the capabilities and inclinations of key actors; and experience with the environmental challenges most common and compelling to regional economic interests, political leaders, and local communities. In addition, regional approaches provide the opportunity to scale down global approaches to match the particular needs and limitations of smaller, poorer countries and their institutions [6] (p. 3).

Effective regional governance may also be understood as the ability of regional organizations to engage in interplay—both vertical and horizontal—especially if it involves the capacity of an institution to mediate among various sources of ODA, as well as various public, private, and civic partners. According to Young, interplay among organizations can produce "institutionally created interdependencies formed by political design and management" and may even lead to "functional interdependencies" [14] (p. 4).

The recent turn toward global support for adaptation—including but not limited to the creation of the Green Climate Fund—may help by providing financial resources for effective interplay, provided that capable regional organizations and leaders can access and use the new resources in ways that are tailored to their regions' characteristics. Thus, organizations like the Centre are impactful only to the extent they can develop and maintain agency and influence in the interplay among local, regional, and global actors in public and private sectors, any of which may oppose or be indifferent to adaptive measures developed by and for other scales of governance and other parts of the world [15] (pp. 439–440).

This, in the context of the small pools of qualified personnel typical of poor, vulnerable countries, places a premium on effective leadership. As Young reminds us, “[i]ndividuals play important roles both in the formation of environmental and resource regimes and in efforts to maximize their effectiveness once they are in place” [16] (p. 93).

1.3. Institutionalization and Environmental Governance

Finally, there is the question of institutionalization. Institutionalization is often poorly defined or taken for granted in the global environmental governance literature. Definitions, when offered, can be self-referencing, even tautological: a group or movement becomes institutionalized when it becomes an institution. Environmental movements, for example, are said to be institutionalized when they transform into or are subsumed by formal organizations. The constructivist literature provides a notable exception, seeing institutionalization as the result of the legitimation of an organization’s or movement’s norms in policy, law, and/or public discourse [17] (p. 2), but this conceptualization is not easily applied to an examination of how an organization develops the institutional capacity to mainstream environmental norms at the local and project levels. Nevertheless, in other ways, research on environmental movements highlights a few characteristics of institutionalization that can be useful here. First, institutionalization processes result in the professionalization of staff. Second, institutions have stable but adaptable organizational structures. Third, institutions can grow their administrative and technical capacity, change their policies and behaviors, and adjust in ways that alter their methods without deviating from their core mission. Fourth, institutions gain recognition and develop professional relationships with other organizations working in similar issue areas [18] (p. 345). In some cases, the latter can lead to “privileged access to political decision-making arenas” [18] (p. 347). The ability of small, regional organizations like the Centre to take on mediating (or anchoring) roles rests with their ability to insert their regional and institutional interests in multiple political contexts and secure the financing they need to build their own bureaucratic capacity [19]. However, interplay at multiple scales strains the capacity of small regional organizations, making them vulnerable to being coopted or overpowered by competing and conflicting interests. The opportunities to be influential may be few, limited, and ephemeral. Key decisions about interplay with established centers of authority—including governments, IOs, and regional bodies—can have critical and lasting effects.

Nevertheless, consistent with Ivanova’s understanding of anchor institutions, Biermann and Pattberg noted some cause for optimism in the fragmented and complex landscape of global environmental governance which, they argue, “allow for the testing of innovative policy instruments in some nations or at some levels of decision-making, with subsequent diffusion to other regions or levels” [19] (p. 285). Similarly, Young noted that, “although institutional interplay can become a source of problems, alert actors can often minimize harmful consequences and promote positive interactions” [20] (p. 79). It follows that much will depend on the right individuals being in the right places at the right times to make those decisions. We cannot completely rule out the fortuitous and situational in the Centre’s ability to establish a working relationship with CARICOM and its autonomous capacity to raise funds and design and implement projects, but it was not an accident that those decisions were made by a small number of leaders with significant experience in local and regional stakeholder participation, and national and global institutions as well. That becomes clearer when we consider the preparatory work done to establish the Centre under the three precursor projects; the extent to which that work involved stakeholder engagement throughout the region; the relationships that placed Centre personnel in the midst of key decisions regarding regional climate change governance; and the focus the Centre has placed on establishing technical expertise and credibility, and learning the politics of interplay.

The timing of the three projects (from 1997 to 2009) means that the Centre developed alongside a robust discourse around mainstreaming, adaptation, and capacity-building in the academic and professional literatures on sustainability, the growing influence of the United Nations Framework

Convention on Climate Change (UNFCCC), and changing notions of “best practices” among development policy-makers and implementing agencies.

By the late 1990s conferees at major international meetings and conventions, natural and social scientists, and some policy-makers began to agree that the lived experiences of highly vulnerable, resource-dependent states confronting climate change needed to be better understood and *scaled up* to inform global strategies for climate change adaptation [21,22]. Adger et al. wrote of “an emerging research agenda focused on identifying generic determinants of resilience” [23] (p. 186). Appositely, those who advocated for, designed, and implemented CPACC, ACCC, and MACC had already concluded that adaptive mechanisms and strategies devised and supported by developed country and supra-national institutions need to be *scaled down* to be effective for SIDS.

In the Caribbean region, economic necessity and social change drove these new policy agendas. Whether or not Caribbean governments, businesses, communities, and regional organizations consciously and explicitly articulated their needs in terms of climate change, those needs increasingly involved coping with threats to development from sea-level rise, intensified storm surges, marine ecosystem degradation, changes in land quality and rainfall, vulnerable infrastructure, housing stock, and food supplies.

Mandates to address climate change, dating at least from Agenda 21, moved the rhetoric of development assistance from support for projects addressing specific problems—limited in time and scope—to programs that took a holistic approach to climate-related stressors. But Caribbean states still lacked the economic, scientific, and administrative capacity to deal individually, let alone in an integrated manner, with the cross-cutting and multi-sectoral challenges posed by climate change. Emphasizing adaptation and mainstreaming was a way to address costly processes already well under way. If SIDS could not affect the causes of climate change, they could at least be better prepared to survive the consequences.

2. Materials and Methods

This article benefits from 15 semi-structured interviews conducted at the Centre headquarters in Belmopan, Belize, or by telephone, over a ten-day period in July, 2019. Subjects included leadership in all departments of the Centre and a representative sample of personnel directly involved in project design, implementation, and fieldwork. A desk review of organizational and project documents from each stage of its development included publications by the Centre and its three precursor programs, reports and assessments by funders and their consultants, and organizational documents, presentations, descriptive materials, and papers (published and unpublished) by Centre personnel. Secondary literature on environmental policy mainstreaming, regional approaches to environmental governance, and interplay in global environmental politics provided the conceptual foundation for the questions posed to interview subjects and the analysis of the data compiled from all sources.

Interview subjects were selected for their knowledge of and experience with the core functions of the Centre, for their contributions to its efforts to build institutional capacity, and their direct participation in the politics of interplay at multiple scales and/or specific projects representative of the Centre’s functions and capacities. Subjects included the top leadership of the Centre at the time the research was conducted; department supervisors responsible for project design and management, communications, monitoring, and evaluation; and line officials with direct experience in project development and implementation. This representative sample was augmented by snowball sampling based on the recommendations of interview subjects. The one interview subject not affiliated with the Centre was a local broadcast journalist specializing in environmental affairs and having several years of direct knowledge of the Centre and its educational programs. Only one interview subject requested anonymity, but for consistency and to protect privacy, subjects are identified only by their professional titles.

All Centre personnel interviewed were asked about their experience, knowledge, and assessment in several related areas. Interview scripts and follow-up questions were adjusted to be appropriate to

each subject's area of expertise and responsibility and the length and type of their experience with the Centre. With varying emphasis and focus, each one was asked about: the guiding vision, development, and evolution of the Centre; the practical implications of mainstreaming climate change adaptation in their areas of responsibility; the mix of prevention, mitigation, and adaptation in their own work and their perceptions of the Centre's goals; the methods, sources of support, partnerships, specific accomplishments, and short-comings for building and utilizing technical capacity related to regional adaptation; the role of educational programs in mainstreaming climate change adaptation; the Centre's work with local and regional stakeholders; the Centre's efficacy in integrating climate change in their areas of responsibility; the benefits and vulnerabilities of the partnerships of which they had direct knowledge, and their knowledge and perceptions regarding the support the Centre receives from specific funders and of ODA more generally. They were also asked to discuss any shortcomings or unmet needs of the Centre, as they would affect mainstreaming and achieving goals (specific or general) related to climate change adaptation.

The documents reviewed for this study included project documents and national communications from the three precursor projects, and Centre documents describing organizational structure, projects, and services. Budgetary information and evaluations of precursor projects and the Centre programs not obtained from interviews came from reports by funders and consultants hired by funders, while additional budgetary information on past and current Centre projects, including funding sources and partner organizations, came from Centre documents, funders' press releases, and documents used in approving, describing, and evaluating the projects.

3. Results

3.1. Caribbean Climate Change Adaption: A Matter of Urgency

The Stockholm Environment Institute estimated the cost of inaction on climate change to the Caribbean region (*ceteris paribus*) at 5% of GDP by 2025 and 21.7% by the end of the 21st century [24] (p. 3). Costs will not be evenly distributed around the region, however. Of the 24 states and territories analyzed, Haiti and Grenada are among the most vulnerable, with estimated losses of 123.2% and 111.5% of GDP, respectively, by 2100 [24] (p. 4). Chief among the reasons for this vulnerability are the dependence of local economies on a services sector dominated by tourism, which contributed an estimated 14% to regional GDP in 2013 [25] (pp. 1–4); and the continued importance of agriculture, fisheries, and forestry [26]. Furthermore, headline-making episodes of extreme weather events became more frequent, including in parts of the region where they were historically rare [27,28]. (For a comprehensive list of vulnerabilities specific to SIDS see United Nations Department of Economic and Social Affairs, 2015. This list is notably similar to the one presented in the 1994 Programme of Action for the Sustainable Development of Small Island Developing States [29]).

Therefore, the three precursor projects unfolded at a time when climate-related vulnerabilities were becoming central to efforts to formulate sustainable development strategies, attract new sources of aid, and coordinate SIDS' participation in international *fora*. In 1994, the first meeting of the Global Conference on Sustainable Development in Small Island Developing States issued the Barbados Declaration and Programme of Action (BPoA), an affirmative statement of commitment to Agenda 21 and the UNFCCC. Under the heading "regional action", the BPoA contains a clear outline for CPACC and MACC [29] (p. 11) as UNFCCC Stage I and Stage II adaptation programs, respectively, and as direct responses to the BPoA [30,31].

At the inception of CPACC in 1997, Caribbean SIDS had already been adapting to climate change, in disaggregated and episodic ways. They also had considerable experience with the difficulties of effective interplay among scales of governance and sectors of the economy and were confronting the limits of their own planning methods, policies, institutions, and data. Therefore, all three precursor projects sought aid for building regional institutional capacity in the areas of data collection, policy-making, and project management. They contained programs for responding to specific local climate hazards,

and pilot projects that demonstrated practical methods for integrating adaptation into all areas of policy at national *and* regional scales. The point was to become less reactive and more forward-looking, holistic, and data-driven in responding to intensifying environmental harms.

3.2. Interplay and Policy Integration

Young described how the two dimensions of interplay in environmental governance—vertical and horizontal—make coordination of efforts toward common goals inherently complex [20,32]. For CARICOM states, institutional complexity derives from the several layers and types of institutions and authority relationships entailed in environmental policy; the intensive and extensive need for development assistance from diverse multi- and bilateral sources; and the tendencies for sub-regions, states, communities, and economic sectors to compete for limited amounts of external funding and technical support, global markets for their goods and services, and regional policies favorable to their particular national interests.

Table 1 gives a simplified picture of the scales and principal actors involved in CPACC, ACCC, and MACC to show their progression as regards funding and the implementation of a regional adaptation strategy.

Table 1. Caribbean Planning for Adaptation to Climate Change (CPACC), Adapting to Climate Change in the Caribbean (ACCC), and Mainstreaming Adaptation to Climate Change (MACC): scales of governance.

Scale	Convention, Agreement, Treaty, Program, or Project	Responsible Institutions
Global/international	Agenda 21, UNFCCC, other MEAs	Conference of Parties (COPs), UNEP, Intergovernmental Panel on Climate Change (IPCC), SIDS (UN), World Bank, Global Environment Facility (GEF), <i>inter alia</i>
Regional	Barbados Programme of Action, St. George's Declaration	Organization of American States (OAS), CARICOM, CCCCC, Organization of Eastern Caribbean States (OECS), University of West Indies (UWI), <i>inter alia</i>
National	Various national sustainable development policies and programs, relevant regulations, codes, and plans	Governments, ministries, departments, parliaments, and parties of 12 participating states
Sub-national, sectoral	Various national sustainable development policies and programs, relevant regulations, codes and plans; business codes; contracts	Governments, ministries, parliaments, and parties of 12 participating states, urban gov'ts, village councils, CBOs, businesses, trade associations, and user groups

At the time the Centre was institutionalizing, both scholars and practitioners were arguing for integrative approaches, especially in small, poor states where the effects of climate change are pervasive and national-level adaptive capacity is limited in both the public and private sectors. So, there is an economic and a policy logic behind integrating adaptation strategies with broader policies for development. Implementing specific adaptation measures (geared to specific problems, sectors, or population groups) may be effective in certain circumstances, but a project-based approach to adaptation planning and financing may not produce the scale of results needed in the long run. CPACC, ACCC, and MACC were informed by this thinking and, although that would change, initially the Centre's approach was regional and programmatic [33] (p. 9); [34].

Space does not permit a full description of CPACC, ACC, and MACCC. Tables 1–3 summarize information on the main components of each project, their contributions to institutionalization and mainstreaming, and the partnerships involved. Columns labeled “responsible institutions” in Table 1, and “institutional actors” in Tables 2 and 3 include principal funders and key implementing partners. These columns show a mix of bilateral and multilateral ODA, partnerships with regional

intergovernmental actors and educational institutions, and the early institutional developments leading to the establishment of the Centre. It should be noted, at this point, that there is little available independent assessment of the sustainability and value of each project's outcomes beyond what is presented below. However, the succession of projects demonstrates that the requirements and expectations of multiple funders were met well enough to qualify for funding of follow-on projects. Also, the narrative establishes the capacity of Centre leadership to leverage multiple sources of ODA for institution building.

3.3. From CPACC to ACC to MACC

CPACC was designed to address “the requirements for UNFCCC Stage I Adaptation activities” [30] (p. 2). The project first took shape as a request by Caribbean governments to the Organization of American States (OAS) for assistance in building capacity to implement the BPoA. The Global Environment Facility (GEF) supported the project with a US\$6.3 million grant, which included funding for a Regional Project Implementation Unit (RPIU), housed at the University of the West Indies Centre of Environment and Development (UWICED) in Barbados [34] (p. 1); [35] (p. 1).

The objective was to help Caribbean countries with vulnerability assessment, adaptation planning, and related capacity-building initiatives [35] (p. 1). The project was meant to take a long-term view, empower National Focal Points (NFPs) to represent the needs and preferences of their countries, and create national networks of “public officials, key stakeholders and civil society to advise on climate change adaptation issues”. These efforts would rely heavily on the ability of CPACC to create new capacity for data collection, analysis, and dissemination, supported by National Coordination and Implementation Units (NCIUs) reporting to the RPIU [36] (p. 12).

The World Bank's final report on CPACC rated it as “satisfactory” for overall outcome, “likely” for sustainability, “sustainable” for institutional development impacts, “satisfactory” for Bank performance, and “satisfactory” for borrower performance [30] (p. 1). (Rankings range from Highly Satisfactory to Highly Unsatisfactory; Highly Likely to Highly Unlikely; and sustainability is ranked from High to Negligible. CPACC received the next to highest rankings for all categories). However, the project failed to account for limits in existing capacity by overestimating the readiness of the UWICED to house the RPIU and provide the necessary staffing and instruction for sustaining the project's other components [30] (p. 5).

ACCC, the follow-on project, helped complete some CPACC components, while taking on a “bridging” function—from data collection and planning, to mainstreaming—that would prove more critical and challenging than originally expected. Funded by the Canadian International Development Agency (CIDA), ACCC was an effort to preserve the gains made by CPACC and prevent backsliding once GEF and World Bank funding and oversight ended. CPACC “placed tremendous strain on already stretched national resources, especially human resources”. Its nine project components challenged the capacity of the RPIU, gave inadequate attention to effective financial management, and had difficulty integrating the divergent interests of twelve sovereign states [37] (p. 6). These lessons helped define ACCC, which began by completing certain unfinished aspects of CPACC. ACCC's most notable accomplishments were in the areas of institutional strengthening at the regional level, building capacity for climate change education, and developing materials and methods for technical training of local and regional officials, including a new Master of Science program in climate change at UWICED (see Table 3) [37] (p. 8).

The consultants commissioned by CIDA and the UN Environment Programme (UNEP) to assess ACCC reported gains in education and training capacity and institutional development at the regional level; noting the initial success of the MSc program in training officials from planning, finance, environment, and meteorological departments of member states [35] (pp. 18–19). Their 2005 report also cited the publication of training instruments for national and regional workshops and conferences, materials to increase public awareness and stakeholder participation in drafting National Climate Adaptation Policies, and the increased inclusion of women in these programs [37] (pp. 14–15).

Table 2. CPACC: Project components, actors, and outcomes.

Regional components	Institutional Actors	Expected Outcome ²	Pilot Action Components	Institutional Actors	Expected Outcome
Design sea-level/climate monitoring component	General Secretariat of OAS (GS/OAS), ³ Regional Project Implementing Unit (RPIU); UWICED	Enhanced technical, scientific and administrative capacity; integrate scientific and local knowledge	Coral reef monitoring	National Focal Points (NFPs) ⁴ in Bahamas, Belize, and Jamaica	Install and maintain monitoring equipment; process, share, and analyze data; partner with gov't and regional agencies and UWI.
Establish databases and information systems	GS/OAS, RPIU, UWICED	Collect data for policy-making and assessment; integrate scientific and local knowledge	Coastal vulnerability and risk assessment	NFP in Barbados, Grenada, Guyana	Develop locally appropriate methodologies to assess economic and social costs; train "country teams"
Inventory of coastal zone resources	GS/OAS, RPIU, UWICED	Baseline data for economic impact assessment; establish needs for mainstreaming	Economic valuation of coastal and marine resources	NFPs in Dominica, St. Lucia, Trinidad and Tobago	Develop locally appropriate methodologies; train "country teams"
Formulation of policy framework for integrated coastal and marine management	GS/OAS, RPIU, UWICED	Apply data to new national and regional policies; begin mainstreaming and scaling up	Formulation of economic/regulatory proposals	NFPs in St. Kitts and Nevis, Antigua and Barbuda	Apply lessons learned; stakeholder engagement; National Climate Change Adaptation Policies and Implementation Plans.
			Greenhouse gases inventory; vulnerability assessment of agricultural and water sectors	NFPs in St. Vincent and the Grenadines (SVG)	Provide support for SVG to prepare First and Second National Communications to UNFCCC

Source: [35] (pp. 2–7). ² For all components, expected outcomes included the purchase and deployment of equipment—including computers, software, connectivity, websites, databases, sea-level and climate monitoring stations—and the training of personnel in its use; ³ GEF designated the World Bank as Implementing Agency. Participating states authorized GS/OAS to be Executing Agency which determined that UWICED would be the most suitable location for the RPIU [35] (p. 2); ⁴ National Focal Points are typically individuals chosen to carry out projects and liaison with stakeholders, funders, their national governments and regional organizations.

Table 3. ACCC: components, actors, and outcomes.

Project Component	Institutional Actors	Expected Outcome
Project design and business plan development	CIDA ⁵ , CPACC NFPs, RPIU	Project implementation plan; continue and build on CPACC accomplishments; business plan for CCCCC ⁶
Public education outreach	CARICOM ministers, RPIU, CCCCC, NFPs, CIDA	Implement public education and outreach program; raise awareness and understanding of governments, private sector, and general public; surveys, educational materials; documentation center; Climate Change Educational Toolkit for NFPs; inform regional and national strategies
Risk management approach to adaptation to climate change	CIDA, U of West Indies (UWI), Caribbean Development Bank (CDB), Jamaica Water Resource Authority, RPIU	Integrate risk management approach in national and regional planning; technical training for national and regional decision-makers
Strengthening regional technical capacity	RPIU, Caribbean Institute for Meteorology and Hydrology UWI; CARICOM, UNFCCC/COP7, SIDS, CIDA	Strengthen capacity for data storage, retrieval and analysis; disseminate information; assist national agencies; provide graduate level education in climate change; downscale climate models; link with South Pacific SIDS
Integrating adaptation planning in environmental assessments	CARICOM, World Bank, CDB, OAS, UNDP, SIDS	Revise EIA practices; develop case studies; workshops and training for donors and decision-makers
Implementation strategies for adaptation in the water sector	CIDA, RPIU, national water resource agencies, Water Resource Authority of Jamaica	Educate water sector planners and administrators in use of climate impact analysis; develop pilot project
Climate change and health	CIDA, RPIU, Pan-American Health Organization, Caribbean Environmental Health Institute, UWI, Health Canada, WHO	Assess vulnerability of health to climate change in 3 Caribbean states
Adaption strategies for agriculture and food	Inter-American Institute on Cooperation in Agriculture, UWI, Carleton U. (Ottawa)	Assess effects on available and prices of food (local and imported); recommend adaptive strategies
Fostering collaboration with non-CARICOM countries	CARICOM, British Department for International Development, OECS, British Foreign Office, Rep. of Cuba	Foster collaboration, share lessons-learned with other vulnerable states and territories

Source: [35] (pp. 10–34). ⁵ Canadian International Development Agency funded ACCC. Its executing agency (i.e., contractors) for the project was Global Change Strategies International and de Romilly and de Romilly, Ltd; ⁶ A new agency of CARICOM meant to institutionalize the functions of the RPIU.

3.4. Establishment of the Centre

A consistent thread running through the precursor projects was the establishment of partnerships aimed at securing multiple sources of funding; building capacity for research, development, and implementation; and moving toward the institutionalization of a regional facility to coordinate those functions. The concept for a center was developed in 2001 and approved by CARICOM Heads of Government in 2002. In 2004, the Centre became operational in its temporary home at the University of Belize. In 2005 it moved to permanent headquarters in Belmopan, Belize. Financial and in-kind support from the governments of Barbados, Belize, and Italy supported its establishment. In 2013 the UN Secretariat certified the Centre as a multilateral organization, and in 2015 the GCF accredited the Centre as a Regional Implementing Entity for the Fund (RIE) with the ability to help CARICOM countries access GCF resources for the implementation of Adaptation and Mitigation measures at the national and regional levels [38–40].

Two-thousand-and-nine was also a landmark year for the Centre. In July, CARICOM Heads of Government approved a Regional Framework for Achieving Development Resilient to Climate Change, which the Centre prepared, on their request, in consultation with stakeholders throughout the region. CARICOM Heads also mandated an Implementation Plan for the Regional Framework, which the Centre prepared using what one official described as the same consultative process. The plan was approved by CARICOM Heads of Government in 2012. It calls for a regional approach to “transformational changes” and guides the Centre’s activities for the 2011–2021 period [34] (p. 21); [40]. It applies a methodology used in other pan-Caribbean initiatives to: (1) optimize the use of limited resources, (2) coordinate with and support national-level capacity, and (3) provide “[o]ne monitoring and evaluation framework to measure progress, transparency and value for money” [34] (p. 22). However, this is a plan that places considerable pressure on the Centre’s human resources. At the time of writing this the Centre employed 42 total personnel, 16 of whom were administrative and support staff, leaving few trained personnel to send into the field for direct management and oversight of projects and onsite training of local partners. Furthermore, many of the political relationships and activities critical to effective interplay, described below, are “anchored” by single individuals from the Centre’s leadership group.

3.5. The Centre Confronts Interplay and Mainstreaming

In analyzing the organizational structure of the Centre, its partnerships and participation in institutions of governance at various scales, it can be difficult to disaggregate the vertical and horizontal dimensions of interplay. Vertical relationships (those between organizations with a hierarchical relationship with each other) run in two directions—upward and downward—based on differences in power and authority relationships. This lack of clarity is endemic to regional organizations and may even be propitious for institutions like the Centre, which are formally subordinate to larger regional organizations and their member states. Relationships that are formally vertical can take on the more horizontal and cooperative characteristics of partnerships when the subordinate organization provides expertise and functionality that its superior lacks. On the other hand, some *formally* horizontal- or downward-looking interplay (so characterized because it involves the Centre and other IOs or CARICOM member states) are in effect upwardly vertical because of the asymmetries of power involved. These asymmetries typically play themselves out in dependent relationships with funders, states asserting sovereignty in ways that limit the Centre’s efficacy, and the internal politics of IOs.

Nevertheless, Centre officials report progress toward more robust and constructive vertical relationships—some upwardly focused at the hemispheric and global levels and others downwardly focused at national and subnational levels—involving a mix of governmental and non-governmental actors. The Centre has stabilized its horizontal interplay with regional and international actors by establishing a hub-and-spoke pattern for coordinating and facilitating adaptation projects [39,40].

3.5.1. Vertical Interplay

The Centre's leadership has a long track record of participation, at the regional and international levels, in promoting climate change adaptation and sustainable development, and implementing ODA-funded projects. For example, its International and Regional Liaison Officer was Director of the National Meteorological Service of Belize, Belize's chief climate change negotiator from 1990 until 2008, and participated in negotiating the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocols. He currently represents the Centre (and CARICOM) at UNFCCC Conferences of the Parties (COPs), and other IOs relevant to SIDS. The Deputy Director and Science Advisor was a review editor for Chapter 16 on Small Island Developing States of the 2008 Nobel Prize-winning Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). While the leadership's academic training is mainly in scientific fields, each one has navigated the politics of environmental governance at multiple scales [41] (p. 997).

The Liaison Officer emphasizes the importance of an active presence and collective voice in IOs related to climate change. He and the Director and Deputy Director noted significant accomplishments garnered from working in concert with SIDS and other highly vulnerable developing countries in those venues, as well as some accomplishments and some frustrations with their efforts at the regional level [40,42].

The Liaison Officer coordinates CARICOM's participation in UNFCCC COPs to pool their efforts and strengthen their presence and influence. He also feels that he was able to leverage Belize's directorship of the AOSIS to enhance the Centre's presence at COP25 in December 2019. The Head of the Centre's Project Development and Management Unit (PDMU) confirmed that a key purpose for attending COPs and participating in AOSIS was to form alliances, build support for the Centre's activities, and disseminate information globally about the Centre's work in order "to generate interest from new entities". However, the Centre is limited in its participation in international *fora*. Other than UNFCCC, it does not attend meetings of other MEAs [43].

Perhaps more significantly, by coordinating efforts of the Centre with AOSIS, representatives now sit in on the informal agenda-setting traditionally dominated by major countries, and participate in some of the off-the-record discussions that happen "in the corridors, over coffee". As a result, delegates from large states go into the formal meetings informed about the perspectives, positions, and interests of small states, and AOSIS and CARICOM members are more unified and clearer as to what large states will and will not consider [42].

As noted above, verticality is more a function of power relationships than of formal institutional structures, and interplay between aid-dependent regional organizations should be considered in that light. For the Centre, dependence on external support (principally ODA) has provided opportunities and created vulnerabilities. The three precursor programs established a record of securing funds from a variety of sources and implementing funded projects to the satisfaction of aid providers. However, the frustrations and uncertainties of being aid-dependent are still significant.

Certain governments have been reliable partners for financing and in-kind support. However, dependence on ODA for operations, equipment, materials, overhead costs, and salaries for projects and day-to-day operations can be problematic. This is especially apparent when funding falls victim to political change in donor countries. For example, the Centre lost funding for a much-needed staff position in monitoring and evaluation after a change of government in Australia, and after President Donald Trump took office in 2017, the United States reduced by nearly half a USAID-funded adaptation project begun in July, 2016 [43].

3.5.2. Horizontal Interplay

The regional level presents its own challenges. The Centre is overseen by a Board of Directors selected by the CARICOM Council of Ministers and reports to the Council on Trade and Economic Development (COTED), a formal relationship that would seem to position it well to mainstream climate change adaptation in regional development policy [39] (p. 4). But the Centre's upward-facing interplay

with its CARICOM supervisors has not always resulted in high levels of support for the Centre's mission, since CARICOM's charter emphasizes trade, economic growth, and integration, which are among COTED's principle responsibilities. (CARICOM's founding document lists sustainability as a goal of economic development but emphasizes growth and international competitiveness [44] (pp. 11–12)).

Having COTED atop the governing structure of the Centre can be challenging. They tend to operate within “different streams” rather than in a holistic manner when it comes to climate change. Their meetings are usually sector specific—meant to address a development or trade issue facing a particular economic sector. It is difficult to have meetings on the environment that get sufficient attendance. Therefore, to access the institutions of member states that could fully integrate climate change on the national and regional levels, the Centre would need to partner with national ministries of the environment. Thus far, the Centre has not been able to convene meetings of those ministries to address adaptation [42].

In addition, although there is a regional framework for long-term evaluation of efforts at building resilience—the Regional Coordinating Committee on Climate Change of CARICOM, of which the Centre is a member—“[it] has only had two meetings, so far. Each member-state was to form a committee to “manage and update those instruments” and report to CARICOM on an annual basis, and country reports were supposed to be consolidated into one regional report to CARICOM, “and that hasn't happened”. So, member states have the instruments developed three years ago, “sitting on the ground because we don't have an M&E [monitoring and evaluation] person at 5Cs [i.e., the Centre]” to encourage and coordinate compliance [45].

Referring to COTED, the Deputy Director agreed. “That has been a challenge but it hasn't prevented us from moving forward, however. Now across multiple portfolios ministers reference the Sustainable Development Goals and are looking for ways to address them in their areas of responsibility”. The Deputy Director now sees the region's governments as “keen to go ahead” but the multiple demands on their very limited resources makes it “a hard call” for them [43].

Working directly with member-state governments can be challenging as well. Problems of capacity and competing priorities frequently intervene. Some governments are more responsive and communicative than others, but that can change rapidly. The Head of PDMU noted that, “there's a fairly high attrition rate. There's a fairly high recruitment rate. And because of that we are always having to restart that process; bring you back up to speed of what it is we are doing, what is to be done. So, that it is a constant process of rebuilding, re-engaging, reinvesting human resources just to get people to know what we are doing, what our respective roles are”. When there are Prime Ministers that understand the need to invest in adaptation, “it goes a long way toward getting the departments on board”. Sometimes it takes a dramatic episode to get the attention of countries' leaders, such as the 2017 hurricane in Dominica. But even then, memories and attention spans can be short and it is easy “to fall back into business as usual mode” [45].

The effective use of funds by governments can also be a challenge. Fee-funded projects do not get the resources they need because the fees are usually deposited in the general fund rather than protected for their intended purpose. In addition, tourism ministries and some operators resist climate change adaptation programs supported by fees (such as airport exit levies), fearing they will make their countries' tourism industry uncompetitive [46].

On the other hand, the Centre has established beneficial partnerships for research and data sharing, many of which are horizontal in nature. These also include international NGOs such as the World Resources Institute; think-tanks such as Climate Analytics (an affiliate of the Potsdam Institute); along with state agencies and regional IOs such as the Caribbean Institute for Meteorology and Hydrology (CIMH), and the government of Cuba. The Caribbean Development Bank (CDB) has also been very supportive of the Centre's participation in IOs. A representative sits on the Centre's Board of Directors and the CDB has funded the Centre's booths and pavilions at COP meetings and other conferences [42].

3.5.3. Funding, Interplay, and Budgeting

Institutionalization of the Centre received an early boost when CARICOM and the World Bank agreed that it should take over full management of the MACC project. The Director was appointed and the Centre became “an executing agency”. “That means for us, that for all of our projects, donor disbursement is directly to the Centre, and not through an intermediate”. So, project implementation was no longer directed by an external “implementing agency”, and the Centre had “much more elbow room” in choosing and working with funders, consultants, businesses, local stakeholders, and partner organizations [43].

The Centre receives no direct financial support from CARICOM or its member states. This was decided originally as a matter of political expediency. In 2002, CARICOM Heads of Government approved the goal of creating a center. At that time, ACCC had exposed the limits of the RPIU and the need for something better institutionalized at the regional level to manage efforts to address climate risks. The ACCC project was funded under CIDA’s Climate Change Development Fund, and CIDA financed the process that established the Centre, which included regional consultations to develop Articles of Association of the Centre, and a business plan that was presented to CARICOM Heads of Government for their approval at their 2002 meeting.

“I think it was rather fortuitous that at that very meeting we were aware of the fact that the Heads were discussing the possible closure of another regional institution because of a lack of resources so we said, you don’t have to support the Centre; we don’t want subventions. In a way it was our saving grace [43]”. They also determined that the typical governing structure of regional institutions would not be suitable. Typically, CARICOM agencies have governing boards with representation from each country. “And they get bogged down in a whole set of political issues”. “We make sure that we are tied into the political system; we report to the Council of Ministers responsible for Trade, Environment and Development [COTED] [43]”. The arrangement has made the Centre dependent on external sources for its operating costs but gives it autonomy to make more purely science-based decisions and develop projects based on its own priorities and assessments of need [43]. In addition, limits on the Centre’s capacity, available funding, and lessons learned regarding what works and how to be most effective in the region have led the Centre to focus on relatively small-scale projects implemented at the local (i.e., subnational) level, and regional projects for expanding technical capacity.

Robinson and Gilfillan report that “annual and audited financial reports for the CCCCC are not publicly available” [41] (p. 994). Tables 4 and 5, below, are based on the Centre’s self-reported funding and expenditures for its first ten years of existence (2005–2015) and funding committed for long-term projects as of 2015. Therefore, these data can provide only a selective and subjective view of the capacity of the Centre to raise and manage funding from multiple sources. However, they indicate a capacity to secure and coordinate ODA from multiple sources and direct it to projects that are regional in scope but comprised of localized and subnational components.

Table 4 provides a rough breakdown of funding for the 10-year period using the Centre’s own scheme for categorizing its services to the region (discussed further below). Table 5 is a snapshot of funding secured as of 2015 for longer-term projects, ongoing or recently concluded at the time of this writing. (All amounts are in 2015 US dollars.) Note that Table 4 separates “regional public goods” from “capacity building and advisory services”. But, as the examples listed indicate, the former includes projects for data collection, management, coordination, and training that enhance capacity housed in the Centre and distributed throughout the region. Also, although it is not possible or meaningful to fully disaggregate funding dedicated to building the Centre’s bureaucratic capacity, the same report that contains these data describes US\$6,626,000 of dedicated funding for building the Centre’s own technical capacity and for augmenting data services and tools accessed through the Centre’s internet portal [47] (pp. 9–18).

Table 4. The Centre: Official Development Assistance-funded projects by type, 2005–15.

Project Type	Funders	Amount	Examples
Regional public goods	World Bank, GEF, EU, DFID, Climate and Development Knowledge Network (CDKN), United Nations Institute for Training and Research (UNITAR), Governments of Italy and Greece	US\$11,985,000	Strengthening Regional Meteorological and Climatological Observing Network; CREWS; Sea Level Rise Monitoring Stations; Caribbean Weather Impacts Group Project; UNITAR meteorological officer training; UWI MSc Program; Down-scaling of Global Climate Models; Climate Change Awareness Workshops; Regional Climate Change Strategic Framework and Implementation Plan; CCORAL; Regional Data Management System; Centre Monitoring, Reporting and Evaluation Capacity
Country/sector specific climate change adaptation infrastructure projects	DFID, EU, USAID, Governments of Italy and Greece	US\$11,087,000	Water-related projects in 5 states; Fisheries projects in 5 states; Agro-forestry projects in 2 states; irrigation projects in 2 states; renewable energy projects in 2 states; Vulnerability, Impact, and Risk Assessments, Strategies and Policies for 8 states
Capacity-building and advisory services	DFID, EU, CDKN, World Bank/GEF, Caribbean Development Bank (CDB), USAID, Governments of Germany and Italy, Commonwealth Secretariat	US\$405,000	Various projects and expenditures for building the Centre's administrative capacity

Source: [47] (pp. 7–36).

Table 5. The Centre: major ODA-funded long-term projects, as of 2015.

Project	Funder	Amount	Duration	Beneficiaries
Coastal Protection for Climate Change Adaptation in the Small Island States in the Caribbean	German Development Bank (KfW)	US\$15,000,000	2014–2018	4 CARICOM member states
Strengthening Coastal Defenses in the Eastern Caribbean	DFID	US\$7,200,000	2016–2020	4 CARICOM member states
USAID Global Climate Change Adaptation Project	USAID	US\$31,200,000 (amount later reduced)	2016–2020	10 CARICOM member states

Source: [47] (p. 6).

Not reflected in the data presented above are the methods the Centre is developing for dealing with the uncertainties of project-oriented funding. Most projects are multi-year and Centre leadership tries to have projects lined up that will cover future operating costs. As of July 2019, the Director estimated that they had funds on hand to cover expenses through 2024; a relatively short timeframe, indicating the possibility of continued uncertainty. In the recent past, disruptions have required flexibility, including ad hoc negotiations, temporary reallocations, adjusting timetables to delay disbursements due to implementation lags, and rescheduling of work to cover shortfalls resulting from political changes in donor countries [43].

For example, when the Trump Administration suddenly reduced funding for USAID's Climate Change Adaptation Program (CCAP), the Centre's Director negotiated with the governments of Belize and Italy to advance funding committed for other projects, and accessed reserves funded by revenue-generating projects [43]. But some disruptions have been costly, such as the aforementioned loss of Australian funding for a much-needed position in M&E [45].

Nevertheless, the Director emphasizes that he has never had to lay off staff. Also, before the sudden cut in USAID/CCAP funding, the project had already provided the Centre with a supercomputer to enhance its functions as a regional node for data collection, analysis, and dissemination.

3.6. Entrepreneurial Activities and Partnerships

In the open and vulnerable economies of the Caribbean, mainstreaming climate change adaptation requires penetrating the private sector at the structural level in industries that are not always climate friendly. With these challenges in mind, the Centre is developing a set of services and projects that integrate ODA and public-private partnerships to promote adaptation and mitigation while producing revenue. These efforts are in their early stages.

The Centre's website lists 12 ongoing "adaptation and mitigation projects", 6 "regional public goods", and 5 categories of "services". The last category includes the programs aimed most directly at creating sustainable sources of revenues. However, there are also several crosscutting projects with the potential to generate revenues through public-private partnerships (PPPs).

Since its inception, the Centre has evolved its mission in two basic ways. The first is the shift from an early emphasis on *programs* that distribute adaptive capacity throughout the region to *projects* that address specific impacts. The other is to pursue projects that contribute to both adaptation and mitigation. In facilitating these changes, Centre officials emphasize the benefits of GCF funding and the Centre's expanding role as a Regional Implementing Entity (RIE). The Centre can request up to US\$50 million per proposal from GCF and up to \$10 million through the GCF "enhanced direct-access" window to support project development [45]. The Deputy Director noted that these small grants have a special value for the Caribbean, because projects considered pilots in larger countries are actually scaled appropriately for SIDS. Since funders do not always take that into account, off-the-shelf technology is built on too large a scale, making the Centre's project development functions central to implementing at scales that meet the practical and technical requirements of regional mainstreaming [46].

More recently, Centre officials have come to see projects that both mitigate and adapt as making good economic sense. Not only does a turn toward mitigation conform to the recommendations of the Paris Agreement, but reducing dependence on imported fossil fuels saves money that may be used for adaptation and more generally to pursue "a climate resilient and low carbon" development pathway. Mitigation projects can also create new employment and investment opportunities and increase efficiency in resource use. Besides, some adaptation projects are inherently cross-cutting. For example, the Centre's community-based, agroforestry projects in Belize and St. Lucia increase food production, conserve carbon sinks, and limit soil erosion [48]. (Basic descriptions of the projects mentioned in this section can be found on the Centre's website, <http://www.caribbeanclimate.bz/>).

Another notable example is the *Arundo donax* Renewable Bio-mass Fuel for Belize: Feasibility Study and Funding Proposal Preparation, supported by the GCF Project Preparation Facility. *Arundo donax*, or wild cane, is an endemic grass that can be cultivated as a biofuel. The Belizean sugar industry burns bagasse (fibrous sugarcane waste) to generate electricity for its mills during harvest season. *Arundo donax* can be a drop-in substitute that allows sugar mills to generate electricity for sale during the off-seasons. This pilot project includes improvements to furnace efficiency to eliminate waste and emissions, and cultivation of wild cane to produce a reliable feedstock [49]. The project was developed for mitigation, adaptation, and revenue. It has three private-sector partners from the sugar industry. The Government of Belize contributed 1800 acres to the Centre, including 500 acres for commercialization and environmental impact testing, with the ultimate goal of creating a profitable entity. If successful, the Centre will retain intellectual property rights for the process and replicate it throughout the region [50,51].

Similarly, the Centre has implemented "community-based adaptation projects" for small-scale desalination installations using reverse osmosis powered by photovoltaics in Grenada and St. Vincent and the Grenadines. These provide freshwater in drought-prone areas, reduce fossil fuel consumption, produce surplus electricity which is fed into the grid, and train local technicians in the maintenance of the systems [50].

In December of 2018, the Centre obtained a Light Detection and Ranging System (LiDAR) by combining US\$2.5 million from USAID with US\$1.5 million from the CDB, US\$600,000 from the Government of Italy, US\$700,000 from the Centre itself, and a private sector partnership with a national airline for use of an aircraft to carry out the surveys [52]. The LiDAR system represents an entrepreneurial turn based on combining ODA with public-private partnerships to expand technical capacity deployed to create new revenue streams. Such projects aim to make the Centre more financially self-sufficient, less politically vulnerable, and a more effective agent of mainstreaming climate change adaptation in both the public and private sectors.

A small reserve fund provides some cushion against unexpected events. In addition, the Centre plans to establish a trust fund to cover regular operating expenses, start-ups, and contingencies [41] (p. 997). In November 2019, the Centre posted a Request for Expression of Interest for a “Consultancy to Develop a Revolving Fund Charter and Operations Manual”. The consultancy would be part of the GCF-funded “Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)”, with the broader goal of establishing a self-sustaining revolving fund that “should be self-sufficient and sustainable” [53] (p. 2). The operations manual would “be an overarching document that will enable members of the Caribbean Community to adapt the Manual based on minor adjustments made at the national level, and the Barbados Water Authority’s Revolving Adaptation Fund Facility (RAFF) Charter will serve as the first case study for the implementation of a RAFF in the Caribbean green economy context” [53] (p. 3). The project “core team” comes from the Centre, the Barbados Water Authority, UWI, and the University of South Florida. The consultancy is seeded with US\$30,000 from CCAP.

3.7. Regional Public Goods and Services

Beginning with CPACC, the provision of regional public goods in the form of information, data, training, and education have been primary functions [36]. The Centre now provides an array of data and climate modeling services essential to its mainstreaming functions.

Most of these are produced and disseminated with governmental and non-governmental partners; some are available without charge through the Centre’s website. These include the Caribbean Climate Online Risk Adaption Tool (CCORAL), intended to guide both public and private sector entities through climate change impact assessments when planning projects, investments, and policies [54]. The website also links to a Clearinghouse Search Tool for accessing the Centre’s archive of climate change related documents, databases, and publications.

The Centre provides training programs on data analysis and management. It has installed weather monitoring stations, and worked with the US National Oceanic and Atmospheric Administration (NOAA) on the Coral Reef Early Warning System (CREWS), a system of monitors that measure changes impacting coral reefs. The Centre supports the aforementioned MSc program at UWI with scholarships and research fellowships, and has developed a program of teaching modules for use in primary and secondary schools.

The primary and secondary school program—the 1.5° Stay Alive Initiative—is a potentially important component of mainstreaming through increased and intergenerational public awareness. It contains four components of 10 to 13 lessons each on global warming, sea-level rise, pine forests, and the social impacts of global warming. It has been used in the Belize public schools on a limited basis. However, the program, although accessible through the Centre website, has been on hiatus and, when active, was not used regularly or disseminated widely throughout the region. When used in Belize public schools, the program received positive coverage in local news media and created an effective partnership between the Centre and school teachers. According to a reporter who observed it in action, the school generated a great deal of excitement among the students. The reporter also noted that during that hiatus period, communication between local media and the Centre was generally less effective than it had been, although it has improved with recent changes in Centre personnel [55]. The Centre planned to revive 1.5° Stay Alive for the 2019-20 academic year [48,56].

Programs categorized as “services” build on a variety of partnerships and funding sources and represent the leading edge of the strategy to combine mainstreaming and greater financial autonomy. They are grouped in four sub-categories: Information for Decision-Making, Project Development and Support, Training, and Consultancy Services. Operationally, there is considerable overlap with “regional public goods” and some of the projects discussed above.

The databases and assessment tools already operational provide a foundation for expanding information and training services. Partnerships with regional organizations, governments, and universities support maintenance of equipment, data gathering, analysis, and modeling services. One essential goal is to collect regional and global data on marine, atmospheric, meteorological, and hydrological change

and scale it down for use at the national and community levels. Here, interplay has been challenging despite growing technical capacity. Member governments have been reluctant to share data collected within their own borders. Weather station data (even from stations installed by Centre projects) are owned by national meteorological services that do not always make it available to the Centre [48,56].

Still, data acquisition, analysis, and sharing are fundamental to the Centre's mainstreaming activities. The LiDAR system and supercomputer, and crosscutting projects are keys to a future direction for the Centre, which the Director envisioned as a regional incubator for climate change adaptation technologies and solutions [43,57]. Recent changes in the internal organization and distribution of effort within the Centre also contribute to this new direction; especially the expansion of the Project Development and Management Unit (PDMU) to increase capacity for Project Development and Support, and Consultancy Services.

3.8. Mainstreaming and Organizational Change

Creating the PDMU builds institutional capacity in three ways that are consistent with the Centre's goal of diversifying its funding sources in order to limit its dependence on ODA. It increases the Centre's capacity as RIE for the GCF, by helping regional actors assess their needs and generate funding proposals. It allows the Centre to play the role of regional consultant for obtaining GCF grants and other sources of funding, and it allows a more bottom-up approach to project proposal and development.

Of the Centre's 42 fulltime personnel at the time of writing this, 9 were assigned to the PDMU: the Head of Unit, one dedicated administrative support staff, four project development specialists, one research assistant, one consultant, and one senior project manager. This constitutes a tripling of its size "in recent months" [45]. With eight of the nine in project development, personnel needed to manage specific projects are drawn from other units, and the *Arundo donax* project has its own dedicated project manager.

Accreditation allows the Centre to apply directly for GCF project funding. Before there was a PDMU, projects were mainly donor-driven. Now, the Centre gets an idea for a project directly from member countries and "then runs with it". Project developers have a form for CARICOM members to fill in with a concept or idea. The developers fill in the technical details and estimate costs. To assist member countries in identifying their needs, project developers created country-specific manuals for vulnerability assessment. First, a vulnerability assessment is done; then a strategy for adaptation is planned with Centre specialists; then an action plan is created. However, the Centre cannot do all the technical work itself and contracts with consultants to do the assessments and strategies. The Centre accepts requests on a first-come first-served basis, since the studies are costly and funds are limited. A vulnerability assessment and strategy for adaptation typically costs US\$100,000. The vulnerability assessments are site-specific, but the adaptation strategies are sectoral and national in scope. For example, the Centre did a vulnerability assessment for fresh water supply in a Belize community. Three years later, they did a national adaptation strategy for water and agriculture, building on the data from the vulnerability study. These studies allow project developers to work with local stakeholders to identify additional needs and seek additional funding [50].

Still, mainstreaming through project management has not reached its full potential. The permanent focal points in each CARICOM member-state, envisioned in CPACC, were never obtained. On-the-ground project management is project-specific and depends on personnel from local governments, CBOs or NGOs who have no permanent affiliation with the Centre. While these local counterparts can compensate for the Centre's limited capacity to manage, monitor, and evaluate projects, they can also limit effectiveness. The quality of management varies greatly depending on the capabilities, dependability, and dedication of the partners, and the quality and quantity of communication between site managers and Centre personnel. One Centre project manager noted that success of her project hinged on the energy and dedication of a single individual managing on-the-ground implementation, something that cannot be counted on for all projects and localities [58].

M&E, as well as documenting and communicating lessons-learned, continue to be challenging areas for the Centre. Despite the importance given to M&E in CPACC, ACCC, and MACC and the Centre's Implementation Plan [34], these functions are intermittent and weakly institutionalized. Additional capacity is needed in four related areas: communications and coordination between the Centre's project managers and the project sites; utilizing existing capacity for short-, medium-, and long-term technical, scientific, and social M&E (including follow-ups after the completion of projects); in-house sharing of experiences, results, data, and lessons learned from completed and ongoing projects; and communication of the Centre's mission and work to the general public [43,48,56].

Where M&E does take place, it is mainly to compile and share technical and scientific data, but the Centre is building capacity for economic impact analysis as well. The Senior Project Development Specialist is an economist and in July 2019 the Centre rehired its Environmental and Social Specialist [59]. Nevertheless, several interviewees noted insufficient capacity for the Centre to do its own M&E on social impacts, and the need for better documentation of lessons learned and best practices based on the Centre's own experiences.

4. Discussion

This section of the paper returns to the major challenges of environmental policy integration [5] (pp. 411–415) for a summary assessment of the Centre's accomplishments and ongoing needs. While a good deal was accomplished by the three precursor projects, I will mainly consider what has happened since the official creation of the Centre in 2005 and how that affects its capacity to achieve regional EPI.

4.1. Complex and Competing Jurisdictions

Robinson and Gilfillan examined some of the political limitations of regional organizations for building adaptive capacity. (The Centre was one of their case studies). "They cannot oblige Member States to act or cooperate in CCA [climate change adaptation] actions, but must work to achieve consensus through dialogue and negotiation. Additionally, because they use external funding to offset CCA costs, these organizations may be constrained by conditions associated with donor support [40] (p. 994)".

The principal task and challenge for the Centre is to play an integrating or mediating role by becoming the regional organization that can overcome national and jurisdictional competition in order to build adaptive capacity. "Our mandate is to lead that transformation process for the entire region. We need to work with institutions with these separate mandates in the region [e.g., agriculture, tourism, industry, water], to transform their approach [43]".

The litany of projects, completed and ongoing, and achievements in gaining support and recognition through vertical interplay indicate significant and sustainable successes. However, the progress has not been frictionless nor is it irreversible. Even with the GCF, the Deputy Director noted, assessment requirements for project approval need hard data, which the region does not always have. The impacts of climate change are obvious and observable throughout the region and still applications are slowed and complicated by a lack of baseline and historical data, while the local effects of climate change manifest so quickly that conditions at the time a proposal is drafted can be quite different by the time the project is approved and implemented. Also, requirements for multiple assessments take time and resources that the Centre does not have in abundance. For example, a coral reef project submitted to the GCF in 2015 has still not made it all the way through the evaluation process [46]. In gaining approval for GCF projects, much depends on the quality of the vulnerability assessments that the Centre does. The Centre's limited in-house capacity, in that regard, has been supplemented by the shared capacity of partners such as the CIMH, UWI, and the Cuban Institute of Meteorology. However, the cooperation of CARICOM member governments may also be needed, and some have limited capacity to cooperate, often take a proprietary interest in their own data,

and have difficulty maintaining a sustained commitment to mainstreaming adaptation due to political turnover and competing sectoral interests.

4.2. A Proliferation of Policy Goals

At the regional level, the Centre faces ongoing challenges in making its priorities paramount in the thinking, planning, and policies of CARICOM and its member states. The pervasive, cross-scale, and multi-sectoral needs of adaptation—from changing the mindset of people about how they pursue their livelihoods to massive capital costs for re-engineering infrastructure—inevitably lead to policy competition, if not conflict [43].

The Centre Director comprehends such challenges in an even broader context, envisioning climate change as a “portal” for addressing sustainable development more generally [51]. This parallels a point made by the Head of the PDMU that extreme weather events in the region, although tragic, redound to the benefit of the Centre by impacting people’s awareness and livelihoods. Unfortunately, that awareness can be short lived, and the Centre faces the challenges inherent in trying to make fundamental change quickly through a project-oriented, incremental approach.

4.3. Insufficient Capacity and Weak Institutional Structures

Balancing the Centre’s mandate for leadership in regional climate change governance with the limits on its institutional capacity remains a concern for Centre officials. As the Director of the PDMU noted: “the Centre, while it can’t do everything, it has to drive the program for investing in resilient development in the region [45]”.

The Centre has been agile in dealing with the problems of aid dependence. Its learning-by-doing approach has allowed it to adapt to a limited and changing resource base. Its strategy for creating autonomous revenue streams through its services and crosscutting projects represents a new phase in that learning process. In these ways, the changing organizational structure of the Centre demonstrates institutional adaptability, but there remain weaknesses in key areas.

The Centre currently underperforms in disseminating information. This includes disseminating information throughout the region to clients, partners, government agencies, and the news media. Local news outlets also suffer from limited capacity—with few reporters, limited equipment, large areas and numerous issues and topics to cover. Local media have been receptive in the past, when the Centre helped raise public awareness with press releases that provided information that was accessible to the general public [55].

The director of the PDMU admitted that persuading regional actors of the need for long-term planning, and providing them with the means to do so, remains problematic. The addition of technical capacity such as the supercomputer and LiDAR system, along with the ongoing cooperation of the Centre’s more stable and reliable partners, can help, but the Centre lacks authority to require the use of its data and modeling services at the national and sectoral levels [45]. Going forward, the bottom-up approach that comes with the project orientation provides valuable input for community-level social and environmental assessment and a potential source for new project implementation partners. In addition, the education and training programs, if disseminated more broadly and consistently, could be long-term investments in heightened public awareness and help produce new human resources to compensate for the Centre’s current shortages in the areas of M&E, communications, and project management.

The current leadership does not expect or intend the Centre to be an expansive institution that pervades the region as a maker and implementer of policy. Instead, their long-term goal is to be institutionalized as a resource for helping CARICOM states’ and communities’ mainstream climate change adaptation through the development of their own organizational resources.

“Our main goal is to build the confidence of countries in the region to address these issues and not depend on external institutions like ourselves. If we have to be on the ground all the time it defeats the process of capacity building. Our final goal is to become redundant, in a sense. The end goal is

to build capacity in the member states. We would want to remain on the fringes of that process and intervene only when necessary [43]”.

4.4. Tensions Between Country- and Sector-Level Initiatives and Responsibilities

The Centre is an agency of a regional IO and must ultimately rely on the cooperation and support of CARICOM and the governments of its member states. Its financial autonomy from CARICOM has redounded to its favor, but the Centre’s influence is still limited by governments with shifting priorities and personnel and weak capacity, who are subject to political pressures from sectors they see as essential to their economic development.

The project-oriented approach adopted by the Centre is strategic, but it is also something of a political work-around. It allows the Centre to build multi-level partnerships to address specific problems of adaptation, bringing many of the benefits that scholars and practitioners associate with bottom-up approaches to development policy. The Centre’s rising profile in UNFCCC COPs and AOSIS increases the potential for “boomerang” effects that could lead to greater global attention and support and increased external pressure on CARICOM member governments to mainstream adaptation in their economic development policies and practices (see, for example, [60], and [61]). But the question remains as to whether these partnerships and pressures will have the desired and, ultimately, necessary effects on national and regional development policy.

5. Conclusions

In confronting the challenges to EPI, each scale of governance and each economic sector can have distinct needs in such key functions as managing trade-offs with other development goals and targets; adjudicating disputes over decision-making authority; collecting and analyzing data; and procuring support (material and political). Dependence on ODA adds a dimension to these problems that developed countries do not usually face; the shifting interests and commitments of donors. In learning to manage these problems, the Centre has adapted its goals, priorities, and methods; discovered its strengths, sometimes through reaction and improvisation; and has come to understand, if not fully address, some of its own institutional weaknesses.

Out of necessity and due to the pragmatism of its leadership, building the institutional capacity to mainstream climate change adaptation in the Caribbean region has been pursued by the Centre not simply as an environmental concept and goal. The mainstreaming of climate change adaptation was the founding goal of the precursor projects and remains the core, stated mission of the Centre, but the process of building the capacity to mainstream has been a process of adaptation in itself. It has meant encountering the real structures and policies of global, regional, and national political economies, and learning to navigate the vagaries of interplay among multiple scales of governance. The Centre’s strategies have become more refined and regularized with time and experience, but can still be described as learning-by-doing.

As a regional organization in a heavily impacted area, EPI can be only part of the Centre’s mainstreaming efforts. Mainstreaming also includes activities, projects, and programs not intended to directly affect policy. In fact, many of the Centre’s programs seek to work within existing policy frameworks; to engage private sector and non-governmental actors directly; and catalyze public-private partnerships. So, what the Centre does goes beyond EPI to a kind of non-state environmental governance, achieved with a contingent set of resources and limited formal authority.

The Centre has taken a multi-dimensional approach to interplay with the goals of increasing CARICOM member states’ influence at the international level; making itself a hub for relationships with international and regional partners and donors; forming partnerships for implementation of its programs and projects; and working more effectively with (or around) member-state governments.

Centre officials have been clear about the importance of horizontal and vertical interplay and adept at securing resources, making the multi-scale partnerships needed to be more influential, and increasing regional adaptive capacity on a project-by-project basis, while adjusting to changing political and

economic circumstances. Their accomplishments in those areas have exposed shortcomings within their own institutional capacity and organizational structure; particularly in the key areas of social assessment, project M&E, external communications, and analysis and dissemination of project-level lessons learned. To compensate for those shortcomings and to continue its process of institutionalization, all indications are that their approach will not be to build extensive in-house capacity to fulfill all of those functions, but to look for additional partnerships and more extensive use of consultants to supplement a small, dedicated staff.

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Abbreviations

ACCC	Adapting to Climate Change in the Caribbean
AOSIS	Association of Small Island States
BPoA	Barbados Declaration and Programme of Action
CARICOM	Caribbean Community
CCAP	Climate Change Adaptation Program
CCCCC	Caribbean Community Climate Change Centre (also 5Cs)
CBO	Community-based Organization
CCORAL	Caribbean Climate Online Risk Adaption Tool
CDB	Caribbean Development Bank
CDKN	Climate and Development Knowledge Network
CIDA	Canadian International Development Agency
CIMH	Caribbean Institute for Meteorology and Hydrology
COTED	Council on Trade and Economic Development (of CARICOM)
CPACC	Caribbean Planning for Adaptation to Climate Change
CREWS	Coral Reef Early Warning System
DFID	(UK) Department for International Development
EPI	Environmental Policy Integration
EU	European Union
GCF	Green Climate Fund
GEF	Global Environment Facility
GS/OAS	General Secretariat of the Organization of American States
IO	International Organization
LiDAR	Light Detection and Ranging system
MACC	Mainstreaming Adaptation to Climate Change
M&E	Monitoring and Evaluation
MEA	Multilateral Environmental Agreement
NCIU	National Coordination and Implementation Unit
NFP	National Focal Point
NOAA	(US) National Oceanic and Atmospheric Administration
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
OECS	Organization of Eastern Caribbean States
PDMU	Project Development and Management Unit (of the 5Cs)
PPP	Public-Private Partnership
RAFF	Revolving Adaptation Fund Facility
RIE	Regional Implementing Unit (of the GCF)

RPIU	Regional Project Implementation Unit
SIDS	Small Island Developing States
SVG	Saint Vincent and the Grenadines
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research
USAID	United States Agency for International Development
UWI	University of the West Indies
UWICED	University of the West Indies, Centre for Environment and Development
WSRN-S	Water Sector Resilience Nexus for Sustainability

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