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Local Governance Capacity Needs for Implementing Climate Change Adaptation in Seychelles: An Assessment Based on the Capital Approach

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Abstract: As a Small Island Developing State, Seychelles is disproportionately affected by climate change, and enhancing her adaptive capacity is a national priority. Identifying and integrating local capacity needs into policy measures can improve multilevel governance and the effective implementation of National Adaptation Plans (NAPs), given that local governments have contextual knowledge about their territories and the climate change challenges affecting them. Based on the Capital Approach Framework (CAF), this study carries out an analysis of local governance capacity needs for implementing climate change adaptation in Seychelles. Data were collected using two methods: (i) questionnaire-led interviews among twenty-four district administrators (DAs), and (ii) an interactive workshop involving thirty-one participants, of which twenty-six were DAs and five were members of the National Climate Change Committee. The CAF was measured in two ways: (i) through descriptive statistics such as frequencies based on interview data, and (ii) through the ranking of types of capital to assess their weightings across four categories using a consensus approach during the participatory workshop. The findings of this study indicate significant political, financial, and human resource capacity gaps, which collectively hinder local adaptation. The critical shortcomings identified include the low participation in national-level decision-making processes, the inability to access external funding sources, and the lack of technical know-how. Through a participatory approach involving the local government representatives and the National Climate Change Committee, ten recommendations for policy measures that can enhance the effectiveness of local governance in climate change adaptation were co-developed. Seven of these recommendations partly address issues related to political capital. These recommendations highlight that a siloed approach cannot effectively address the impacts of climate change. For example, one of the recommendations stated that land-use planning should be guided by location-specific vulnerabilities, as these differ across districts.

Keywords: local governance; participation; adaptation; capital approach; Small Island Developing State; Seychelles



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1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) reaffirmed that unabated anthropogenic influence on the climate system would cause unprecedented impacts on both human and natural systems [1]. Such effects from climate change are likely to affect Small Island Developing States (SIDS) more and may constrain their abilities to achieve sustainable growth. Moreover, SIDS, when compared to non-island nations, are disproportionately affected by climate change and suffer from similar vulnerabilities due to their exposure to impacts and various constraints in terms of size and resources [2]. As far back as 1992, the United Nations Conference on Environment and Development (UNCED) was

the first to recognize SIDS as a distinct group of fragile nations when it stated “SIDS, and islands supporting small communities are a special case for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion, and isolation from markets place them economically disadvantaged and prevent economies of scale” [3].

In essence, the environmental challenges faced by other SIDS are similar to those in Seychelles [4]. They include sea-level rise, increased air and sea surface temperatures, episodes of coral bleaching, increased coastal flooding, erosion, saltwater intrusion, and an extended dry season accompanied by rainfall variability [5,6]. Approximately 90% of Seychelles’ critical infrastructures are located on the narrow coastal plateau of Mahe Island, at an average elevation of 2 m above sea level [7]. The predominantly steep topography has led to land reclamation and coastal squeeze, resulting in the concentration of the population and economic activities along the coastline [8]. As a result, sea-level rise could displace a large portion of the population, low-lying coralline islands could disappear, and the tourism and fisheries industries could be largely disrupted [9].

Furthermore, Seychelles is highly vulnerable and has suffered from several disasters in the last four decades, some of which have been driven by climate change while others are non-climatic. These events dated back to coastal erosion on Praslin in 1986, massive coral bleaching due to excessive warming of the ocean temperature in 1998, heavy rainfall and coastal flooding on Mahé in 2004, a tropical cyclone in 2006, and tidal flooding on Mahé in 2007 and 2012 [10]. Coral reefs have been altered significantly due to the 1998 Indian Ocean Warming, during which Seychelles suffered massive coral bleaching [10]. This episode of coral bleaching caused mortality in the upper 15–20 m of the ocean on average across 70% of Seychelles’ granitic islands in addition to a decline in reef growth [11]. An extended drought period can be observed in Seychelles, especially during the last decade, with visible signs of water scarcity for domestic and agricultural uses [12]. New rainfall distribution patterns have emerged amidst increasing coastal development compared to the situation some three decades ago [13]. Some consequences include degrading coastal dune vegetation, overtopping sea walls, saltwater intrusion into farmlands, and flash floods that last for two to three days in low-lying districts [14]. Wetlands, which are an important source of freshwater in Seychelles, are highly degraded through the proliferation of invasive alien species [12]. Both hard engineering adaptation intervention such as sea walls, rock armoring, gabion, breakwaters, and nature-based solutions such as timber piling, wetland rehabilitation, rainwater harvesting, rehabilitation of mangroves, and dune vegetation, have been implemented across several districts in Seychelles [15]. Given the uncertainties existing in the impacts of climate change—e.g., timing, intensity, and distribution—adaptation to climate change is an ongoing process and is a key consideration for vulnerable SIDS such as Seychelles.

For these reasons, climate change adaptation is a national priority in Seychelles. This position is emphasized in the National Climate Change Policy [16], Initial and Updated Nationally Determined Contributions [17,18], and the Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) [5]. Even within a nation, climate change impacts are not evenly distributed and may vary from location to location; therefore, locally driven actions are essential [19–22]. These impacts from climate change occur in a geographic space exposed to different governance forms. The IPCC emphasizes the urgency and necessity to enhance governance systems to effectively respond to current and anticipated impacts of climate change [23]. Such a call resonates with previous studies that have increasingly acknowledged the role of local governments in addressing climate change [2,24,25]. The focus on local governance, understood as a political and institutional process through which decisions are taken and implemented in a specific sub-national geographic region, is recognized in the National Adaptation Plans (NAPs) adopted under the UNFCCC. In the NAPs, a more significant consideration of local actors as implementers of climate change adaptation is emphasized [26,27].

Local governance is involved in a wide range of activities such as incorporating climate risks in development plans; mobilizing resources for adaptation; adjusting building and land use regulations and climate-proofing for development; and enhancing disaster preparedness, response, and recovery [22,28,29]. Therefore, local governance encompasses a range of planning, regulatory, and service provision mandates, of which climate change has important implications for implementing these mandates [20]. Local governments have contextual knowledge about their territories as the closest level to the people [30]. They can play a vital role in driving and facilitating adaptation at the local level, thereby complementing national efforts. However, local government is situated at the base of the multi-level governance hierarchy and beset by resource limitations [31]. Several studies have applied the capital approach—an indicator-based governance assessment method—to assess local governance based on five types of capital [19,20,32–35]. However, each local context is different, and the indicators signifying successful adaptation in one region may not necessarily be appropriate in another [36]. Therefore, the need for similar studies is utmost, given the vulnerability of Seychelles to the impacts of climate change. More importantly, previous studies in this area did not provide a ranking across the types of capital, which is vital in identifying strengths and weaknesses across local governance systems; this shortcoming is addressed in the current study.

Despite the improvement in climate change policies and strategies in Seychelles, there is a general lack of adequate and specific considerations on the role of local governments [8,16]. Moreover, improved policy planning does not necessarily lead to improved implementation, as it is not easy to predict outcomes primarily dependent on policy implementers' capacity but multi-level governance effectiveness [37]. Therefore, this study carries out a local governance assessment by addressing three objectives, as follows: (i) an assessment of local governance capacity needs to implement climate change adaptation across social, political, human, financial, and environmental capital based on interviews with DAs [32]; (ii) a participatory process to provide the ranking (high, moderate, low, and very low) of these capital based on a consensus approach; and (iii) a participatory process to co-develop recommendations for policy measures to enhance local governance for climate change adaptation. The IPCC underscores the importance of strengthening institutional conditions which enable climate change adaptation, given that “the ability to scale up beyond the local remains challenging and little examined” [23]. This study will provide insights into enhancing local climate change adaptation, which the government could integrate into the National Climate Change Strategy for Seychelles.

2. Theoretical Framework—The Capital Approach

The Capital Approach Framework (CAF) applied in this paper was developed by Máñez et al. [38] in their study assessing risk governance in climate change. Since then, scholars have used this framework to assess coastal management in South Africa and Kenya [20,34] and local governance capacity needs for climate adaptation in Mauritius [19]. The CAF is a valuable assessment tool that establishes a systematic governance baseline and reference point to assess and measure future changes [38]. The governance baseline is essential for monitoring and determining the governing body's adaptive capacity [39]. The capital approach provides a means to assess local governance qualitatively and quantitatively and has gained traction in climate-related studies. Such a framework is essential, especially for adaptation interventions that are generally site and location-specific [34].

This framework builds around five types of capital, social, political, human, financial, and environmental (Figure 1), with several factors assigned to each capital. Initial work by Máñez et al. [38] used 13 factors distributed across the 5 types of capital. However, the number of factors varies depending on the topics under consideration and the study context, informed by a comprehensive literature review. Within the context of the CAF, capital refers to the assets, capabilities, properties, or other valuables that collectively represent a governance system's excellent functioning. At the same time, indicators are the units of measurement to gauge the performance of factors and types of capital [38].

Reports, policies, and strategies were reviewed to identify factors enabling climate change adaptation in Seychelles. The review process was complemented by consultation with key informants from the Ministry of Local Government and Community Affairs (MLGCA), as Williams et al. [19] recommended. The consultation and literature review process led to the development of sixteen factors and their corresponding indicators, which were used to assess local governance capacity needs for climate adaptation in Seychelles (see Table A1). The CAF was based on interviews guided by specific factors and their corresponding indicators for assessment. For example, External Collaboration (S1) was one of three factors related to social capital. The authors assessed this factor (S1) based on three indicators, as shown in Table A1, and this procedure was same for other factors.

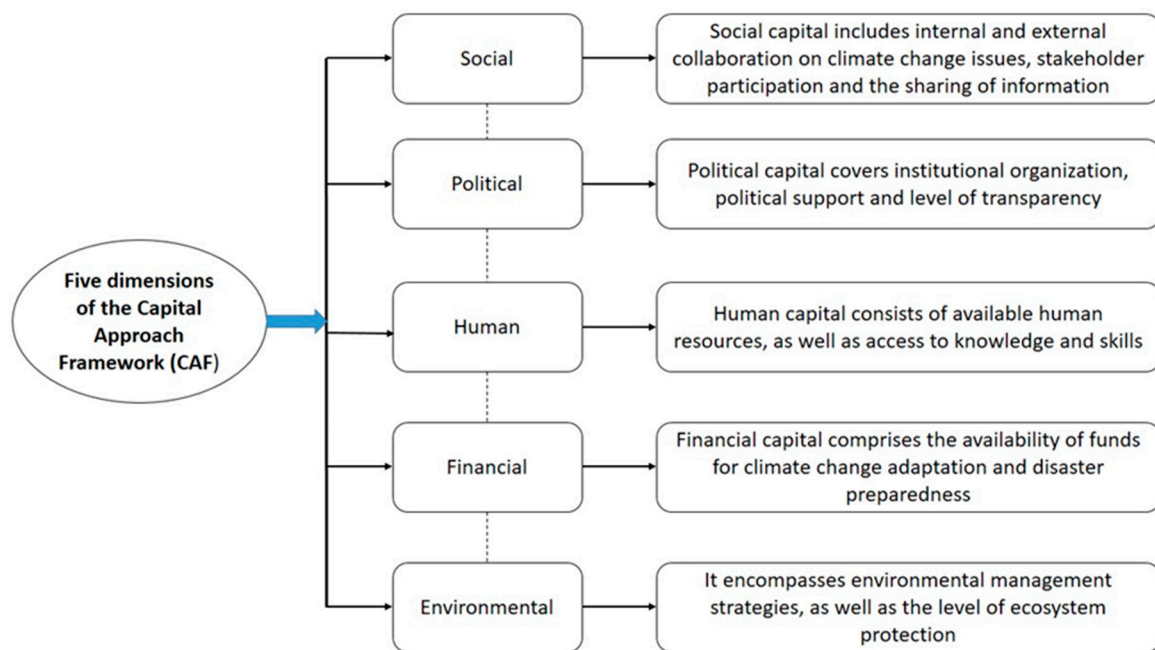


Figure 1. Description of the five types of capital as applied to the current study based on the CAF. Source: Inspired by Máñez et al. [38].

The CAF presented in Figure 1 is grounded in the premise that the good functioning of a governance system depends on a combination of different forms of “capital”, or assets, capabilities, properties, or other components of that system [38]. Therefore, the prevailing conditions in a nation can influence the manifestation of these types of capital and the role of local governance in climate change adaptation. Climate Change became a topical issue in Seychelles following the signature of the UNFCCC in June 1992. One of the first steps toward this endeavor was the setting up of the Seychelles National Climate Change Committee (SNCCC) in August 1992. The main objective of the SNCCC is to provide overall coordination in the development and implementation of the national climate program and to act as an interface between the national climate program and the government [40]. Members of the committee include representatives from Ministries, Departments, and Agencies (MDAs); the private sector; and non-governmental organizations [8].

Seychelles is among the SIDS that has been on the frontline regarding environmental issues. The island nation is a signatory to several international conventions and treaties. They include the Kyoto Protocol to the Convention on Climate Change, the Sendai Framework for Disaster Risk Reduction, the International Convention for the prevention of maritime pollution (MARPOL), the Convention on Wetlands or Ramsar Convention, the International Convention to Combat Drought and Desertification, and the most recent being the Paris Agreement, which is the framework for the global climate response implemented through Nationally Determined Contributions (NDC) [16]. Seychelles has a long track record of policies and regulatory frameworks for environmental protection. These policies

date back to the Environmental Management Plan of Seychelles (EMPS) 1990–2000 and 2000–2010 [41,42]. These indicate that the Seychellois population is aware of the importance of the environment, given that the economy is dependent on tourism, fisheries, and agriculture, which are climate-sensitive livelihood activities.

SIDS, undoubtedly, is among those countries where the lack of human resource capacity for supporting sustainable development is of significant concern. Most SIDS, including Seychelles, lack sufficient human resources in critical fields such as climate change and science and technology essential for sustainable development [43]. The need for new and specialized skill types is of more significant concern as most tasks that require these skills are performed by external consultants. The United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States suggested that a lack of skills could severely hamper the ability of SIDS to manage climate change impacts [44]. Human resource capacity for climate change adaptation is a challenge even in some developed countries. For example, a study across seven local government in Australia based on a multi-criteria analysis found that their capacity to use available information to develop geographically specific action plans was limited [22].

The role of finance in climate change action is widely acknowledged in global agendas. The Addis Ababa Action Agenda recognizes that “funding from all sources, including public and private, bilateral and multilateral, as well as alternative sources of finance, will need to be stepped up for investments in many areas including low-carbon and climate-resilient development [30]. Despite financial support from international and national organizations to implement climate change projects in Seychelles, more financial resources are needed to implement projects across districts. Local authorities serve as a vehicle for implementing nationally driven policies to ensure that the mandates outlined at a national scale are carried out and deliver meaningful results at the local scale. However, achieving this objective will require access to the local government’s financial resources, which are constrained even to access domestic funding sources [14]. These types of capital and how they manifest would impact local governance capacity needs for implementing climate change adaptation in Seychelles. For example, climate change is a cross-cutting issue and cannot be tackled in isolation. Therefore, a cross-sectoral approach through effective collaboration would ensure the pooling of resources and expertise to fast-track climate-related investments. Identifying local capacity needs is critical for enabling multi-level governance to effectively respond to climate change (see Figure 1), given that projects will be implemented within a district.

3. Materials and Methods

3.1. Case Study Site

Seychelles is an archipelago of 115 islands in the Indian Ocean. With a land size of 455 km² and an Exclusive Economic Zone (EEZ) approximated at 1.4 million square kilometers [16]. The island nation is located off the Eastern coast of Africa (Figure 2) between 4 °S and 10 °S [16]. The inner granitic islands include the main islands of Mahe, Praslin, and La Digue, while the outer islands are both granitic and coralline [10]. The climate of Seychelles is tropical. A recent study showed that Seychelles air temperatures are rising, as demonstrated by more extraordinary anomalies recorded during the last 15 years [5]. For example, while the annual mean temperature anomaly between 2006 and 2021 increased by 0.3 °C, there were two years with extreme anomalies. Specifically, the years 2019 and 2020 recorded anomalies of 0.6 °C and 0.8 °C, corresponding to the highest values ever recorded compared to figures as far back as 1972 [5]. In addition, the same study found that average temperatures are increasing by 0.0214 °C yr⁻¹ and 0.014 °C yr⁻¹. If such a trend continues, minimum and maximum air temperatures in Seychelles will likely reach 20 °C and 31 °C by the year 2050 and 29 °C and 35 °C by 2100, respectively, under a business as usual (BAU) scenario [5].

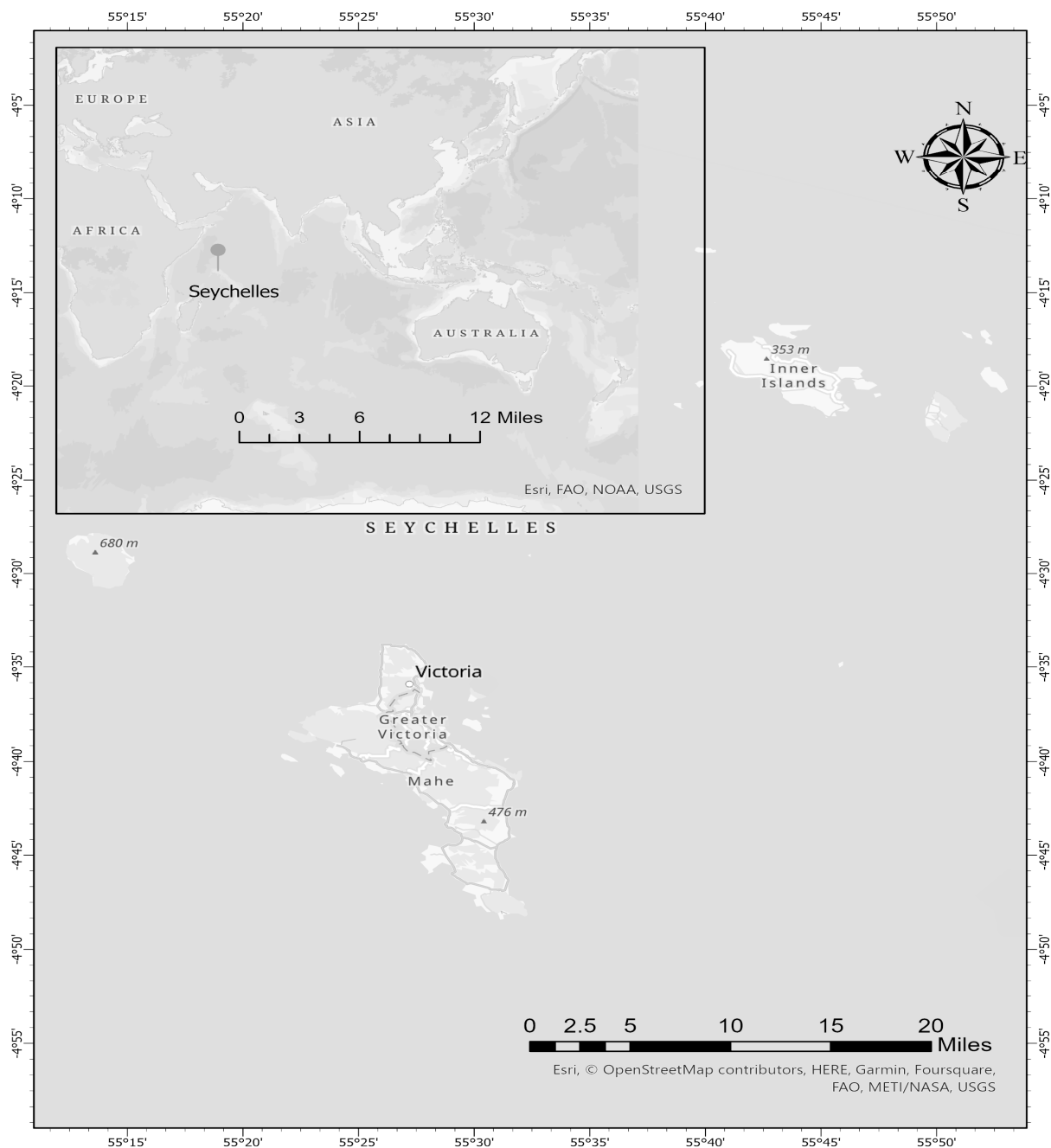


Figure 2. Location of the Seychelles archipelago.

There are variations in annual precipitation from the inner and outer islands, with a yearly rainfall of around 1950 mm and 1700 mm on Bird Island and Denis Island. Mahé, the main island, receives the highest amount of rain, with 245 mm of rainfall within a single day and an annual average ranging from 2000 mm to 2300 mm [6]. Such a daily amount of rain will likely increase the frequency of hazards such as flash floods and landslides. Generally, the rainfall pattern in Seychelles is quite erratic from year to year and, in some instances, is influenced by the El Niño–Southern Oscillation (ENSO) cycle. In El Niño, it can sometimes rain a lot during the dry season, while the rainy season can be drier than usual. In La Niña years, the opposite happens [5]. Aside from rainfall, sea-level rise is of greater importance to Seychelles, not just because it is a SIDS. Still, over 90% of Seychelles' development has occurred along the coastline, and sea-level rise might constrain sustainable growth. The last ten years recorded a sea-level rise of $+0.61 \text{ cm yr}^{-1}$ [5].

Furthermore, Seychelles' sea surface temperatures (SST) indicated that the annual mean between 1990 and 2019 stood at 28.58 °C with a warming trend of +0.02 °C yr⁻¹. If the current trend is maintained, the SST will rise by +0.2 °C in 2030; +0.6 °C in 2050; +1.2 °C in 2080, and +1.6 °C by 2100 relative to the 2019/2020 baseline [5]. Impacts of climate change are primarily experienced in Seychelles through heaving rainfall events causing inundation and flash floods, landslides, an extended dry season that impacts water resources, and the proliferation of invasive plant species. Sea-level rise also causes coastal erosion and saltwater intrusion, in addition to ocean warming that led to the 1998 and 2016 episodes of coral bleaching [8,45].

Seychelles has a total population of 96,762 [46], with a population density of 446, 182, and 159 inhabitants/km² across the three granitic islands of Mahe, Praslin, and La Digue, respectively. These figures are much lower in the Coralline Islands and vary from 10 to 20 inhabitants/km² [47]. Its local government structure was established in 1994 and is governed by the Local Government Act of 2015 [48]. The local government structure in Seychelles has undergone a series of reforms to strengthen community services, culminating in 27 District Administrations in the MLGCA. In July 2018, seven Regional Councils were established to give inhabitants a voice in managing their affairs. These local government structures align with the Seychelles Government's vision to promote sustainable development in the Seychellois communities based on a participatory approach. District Administrators were appointed prior to the year 2018. This is now different as the DAs have to apply for their position when advertised and are recruited as public servants irrespective of their political affiliations. The DAs are to serve this purpose by facilitating development initiatives within their districts per the Local Government Act of 2015 [48].

According to this Act, some responsibilities of the DAs include developing strategic plans in line with government policies, formulation of district development plans with MDAs, and their general roles in oversight and facilitation [48]. Budget for local government are approved annually by the National Assemble, just as for other ministries. The budget as based on a yearly National Action Plans to be implemented by the MLGCA [48]. The goals of local governments' activities are selected based on its action plan which must align with national development efforts [49]. Areas for collaboration are sort after with other MDAs to ensure the effective implementation of national development strategies. For example, the MLGCA is expected to work closely with the Ministry of Agriculture, Climate Change and Environment (MACCE) on climate-related issues. The MACCE is charged with ensuring the constitutional right of every person to live in and enjoy a clean, healthy, and ecologically balanced environment, providing a reliable, affordable, and safe water and energy supply and building resilience against climate change and disasters. Achieving these objectives would require the active participation of local government authorities, of which there has been some collaboration between the MACCE and the DAs in several projects. However, the local government in Seychelles is not immune to the challenges faced within a multi-level governance arrangement. Thus, as a governance entity with the mandate to promote sustainable development across their respective districts, the DAs were selected as an entry point to assess capacity needs for climate change adaptation.

3.2. Methods

The authors applied two approaches to achieve the objectives of this study. These approaches include (i) a CAF to assess the capacity of local governance for implementing climate change adaptation and (ii) an interactive workshop. The aim of the workshop was for the ranking of factors and types of capital, and also for the co-development of policy recommendations that can enhance local governance of climate change adaptation in Seychelles. All the steps followed throughout the data collection process are presented in Figure 3.

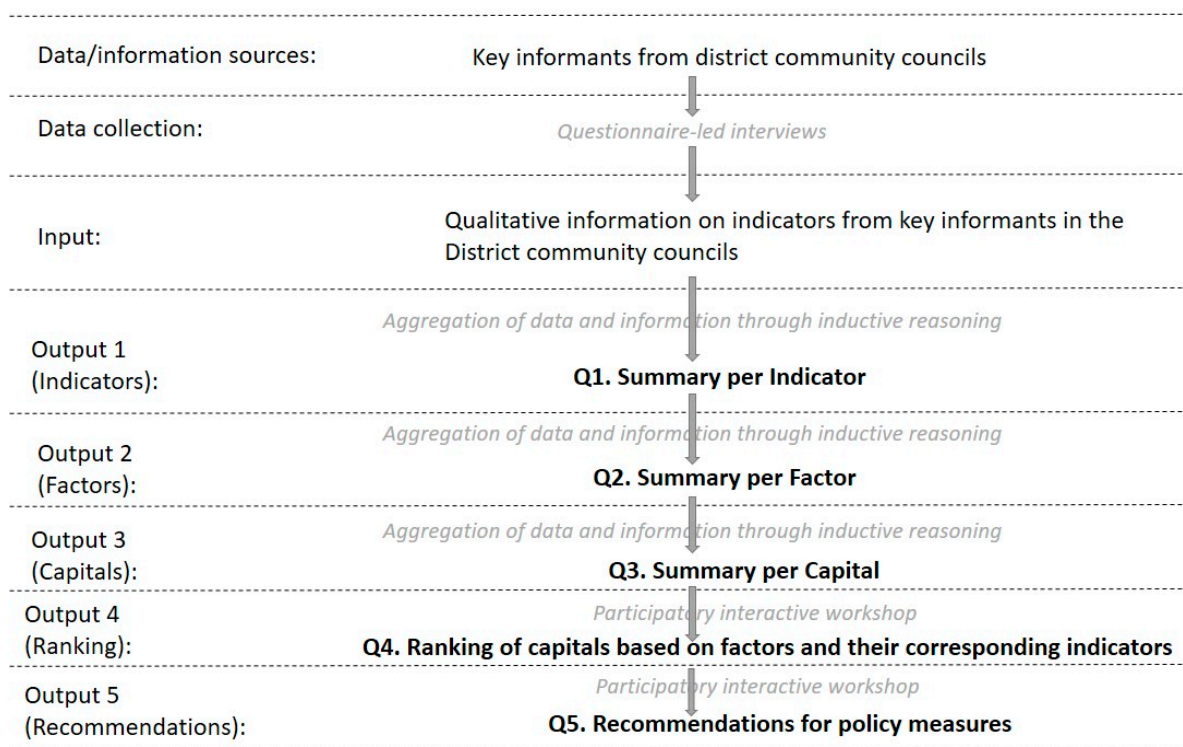


Figure 3. Data and information collection and analysis process applied in Seychelles. Inspired by Williams et al. [19], and Celliers et al. [20].

3.2.1. Application of the CAF in the Current Study

Climate change adaptation varies significantly from one location to another, and developing benchmarks as specific thresholds for what constitutes effective governance is neither desirable nor appropriate [19,20,34,36]. Therefore, applying the CAF to the current study was based on several factors that reflect the local context (see Table A1). These factors were, in turn, evaluated by a group of qualitative indicators (see Figure 3 and Table A1) to assess climate adaptation needs [19,50]. Qualitative information on indicators that the DAs provided was later aggregated through an inductive approach to the factor level (see Figure 3). This process involves condensing and summarizing the raw contextual data, establishing connections between the research objectives and the data, and identifying underlying structures and patterns that are evident in the data [50]. The process was repeated for aggregating data from factor to the capital level, producing an overall governance baseline that can be used to assess progress over time.

The strength of each capital was determined by whether the factors and indicators of the relevant capital performed strongly or poorly during the questionnaire-led interviews. Responses were characterized as binary and ordinal unit measures and assigned a color code according to their performance. For the complete list of factors and indicators pertaining to Outputs 1, 2, and 3 of Figure 3, see Table A1. Positive responses were depicted in green, varied responses in yellow, and negative responses in red. Confidentiality was maintained throughout the interviews by assigning codes for each respondent rather than recording their names. Study participants were informed that they had the right to discontinue or refuse to participate. Hence, all participants were fully informed of the objectives of the study. This study was approved by the Department of Environmental Sciences and all necessary research regulations and ethical considerations were applied during the study. A total of 24 DAs participated in the questionnaire-led interviews between the 7th and 28th of February 2022. These face-face interviews took place in the conference room at the MLGCA and lasted for about an hour.

3.2.2. Participatory Workshop

A half-day workshop was convened on the 19th of April 2022 at Eden Bleu Hotel with twenty-six DAs/District Office Managers and five National Climate Change Committee members. This workshop was facilitated by a team of three researchers from the University of Seychelles. The workshop participants had two main tasks: (i) to provide a ranking for factors within each capital and an over ranking across the five types of capital, and (ii) to co-develop recommendations for policy measures needed to enhance local governance of climate change adaptation in Seychelles. A consensus approach was applied for both activities during the workshop. All the workshop participants had to deliberate with the help of existing examples and knowledge of local context on why the group should assign a specific ranking. The ranking for each indicator and also among the five types of capital is based on a scale of four, corresponding to high (1), moderate (2), low (3), and very low (4). Smaller values, e.g., 1 and 2, mean those that strongly performed, and higher values of 3 and 4 correspond to those that performed poorly.

The workshop participants were divided into three groups of 9 to 10 to devise policy recommendations based on discussions around the 16 factors across the five types of capital that were ranked during the first exercise (Figure 4). These groups came up with fourteen recommendations and, after a general discussion, resulted in ten policy measures that could enhance climate change adaptation at the local level was co-developed (see Figure 4). Best practices for co-development of policy with stakeholders were adhered to during the process. For example, it is important not to over-design but rather encourage stakeholders to drive an inclusive, reflective, context-specific, and unpredictable strategy for achieving reforms [51]. Participatory workshops can also enable high-quality democratic governance and strengthen civil capacity by involving local government administrators [52]. Furthermore, expected benefits include building confidence and trust in policy formulation, mutual learning among participants through sharing information and experience, and ensuring that outcomes reflect context-specific knowledge and expertise, which sometimes could be ignored [19,53,54].

Factors		Ranking of factors	Overall ranking across capitals
Social	S1: External collaborations	2	2
	S2: Internal collaborations	1	
	S3: Information sharing on climate change	3	
Political	P1: Political support and leadership on climate change adaptation	3	4
	P2: Regulatory framework	2	
	P3: Transparency	3	
Human	H1: Leadership	1	3
	H2: Human resource capacity	2	
	H3: Access to climate information	3	
Financial	F1: Funds for adaptation	2	3
	F2: Funds for coastal management	1	
	F3: Funds for disaster preparedness	3	
	F4: Ability to mobilize external funding	4	
Environment	E1: Importance of ecosystems to the nation's economy	3	1
	E2: Understand the drivers of environmental degradation	2	
	E3: Climate change adaptation measures implemented	1	

Figure 4. Ranking of factors across each capital based on a consensus approach. Note: High (1); Medium (2); Low (3); Very low (4).

4. Results

Responding to the first objective of this study, the capital receiving the most positive responses was the environmental capital, followed by social and financial capital (Figure 5). Obtaining the lowest positive response was the political and human capital. The political capital received 23% moderate and 77% low ratings. This rating was the least so far received across the five types of capital (Figure 5). The 16 factors alongside (see Figure 4) their corresponding indicators (Table A1) chosen to validate the findings of the CAF were agreed upon by the DAs. The primary outcomes of each capital are presented in the following section.

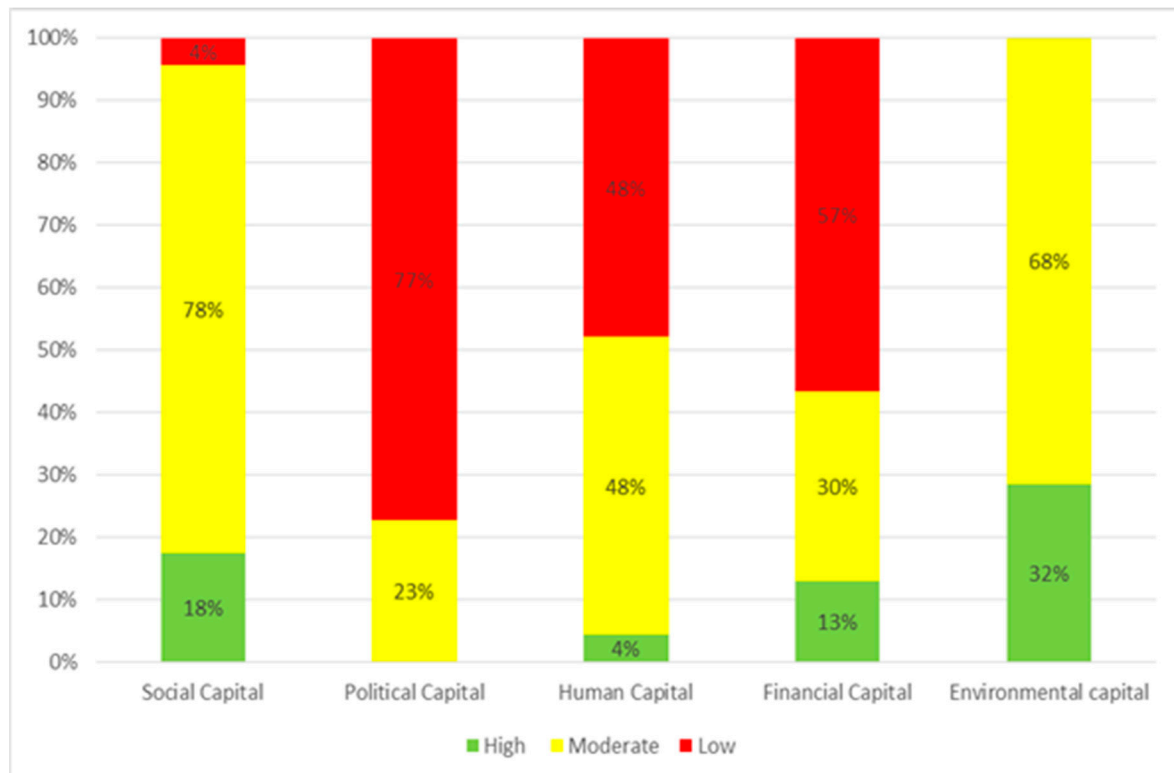


Figure 5. Assessment of the capacity of local government to implement climate change adaptation policies in Seychelles.

4.1. Environmental Capital

The environmental capital received the most favorable evaluation with the highest high (32%) rating and another 68% for a moderate (Figure 5). The District Administrators were highly aware of the importance of ecosystems to Seychelles' economy. The DAs were explicit as they identified tourism and fisheries as the most significant contributors to Seychelles' Gross Domestic Product (GDP) which are highly dependent on the environment. On the other hand, DAs unanimously acknowledged the vulnerability of Seychelles as a SIDS with compound flooding, saltwater intrusion, coastal erosion, landslides, and coral bleaching, cited as some of the challenges faced by the island state. Furthermore, the impacts of climate change were considered an issue of significant concern by the participants who expressed fear regarding the overtopping of sea walls, especially during the southeast Monsoon season that runs from May to October.

During the workshop, there was a general agreement concerning the insufficient implementation of environmental legislation and strategies to protect the environment. Particular emphasis was on safeguarding environmentally valuable lands from development, which, according to the participants, has led to reclamation in some instances. Participants further highlighted the passive engagement of stakeholders in land use planning and a lack of

usable information on the natural environment for appropriate land-use planning. The workshop participants recognized that access to environmental data, especially risk maps, is challenging because even when available, it is just for a few districts. District Administrators further opined that the challenge goes beyond access to data to the availability of risk maps. It was mentioned during the workshop that the Disaster Risk Management Division (DRMD) has as one of its projects this year to develop district-specific risk maps using the Geographic Information System (GIS).

Although climate change adaptation (CCA) plans are available nationally, most DAs interviewed (about 75%) and during the workshop mentioned that such plans or management strategies are hardly known at the district level. The 25% of the districts with environmental management strategies have been developed in collaboration with the Ministry of Agriculture, Climate Change and Environment (MACCE). Such communities were generally considered highly vulnerable based on their location (likelihood of landslides or other impacts of climate change). That notwithstanding, the DAs did mention their participation in some projects that the MACCE and other MDAs have implemented. Three examples of projects cited were (i) the coastal management plan with support from the World Bank, (ii) the Ecosystem-based Adaptation to Climate Change Seychelles project, financed by the Adaptation Fund, (iii) and the ongoing Ridge-to-Reef (R2R) project (2020–2026) which is co-financed by Seychelles' Government, the United Nations Development Programme (UNDP) and civil societies. As reiterated by the DAs, environmental NGOs are very active in Seychelles and collaborate closely with the Government and communities across the different districts. The high environmental awareness led to the creation of five watershed committees on Mahe and Praslin Island.

4.2. Social Capital

Results for the social capital indicated that routine collaboration within the Ministry of Local Government and Community Affairs (MLGCA) is generally much more robust than among external stakeholders. The strength of internal cooperation is reflected in the high level of ranking provided by the DAs (see Figure 4). According to the workshop participants, the MLGCA organizes regular meetings to discuss developmental issues and projects across districts, which is mandatory for all the DAs to attend. During the workshop, participants observed that improved cooperation between the DAs and, by extension, the MLGCA and other MDAs requires tremendous improvement, especially on cross-cutting environmental-related issues. There should be mandatory consultations with the respective DAs when development projects are planned and implemented in their respective jurisdiction. While the DAs acknowledged their participation in some projects within their districts, they cited a few instances in which they were not consulted, nor did they participate in such projects.

Accessibility and information sharing on climate change by the Seychelles Meteorological Authority (SMA) and the MACCE to help districts plan for climate change received meager ratings (Figure 4). The DAs reaffirmed that access to climate information is essential for adaptation planning and project design. While they did mention that climate information is made available upon request from the respective MDAs, the data need to be enhanced before it can become usable. The emphasis was on the need for improved access to relevant and recent environmental and climate data presented pragmatically, particularly more comprehensive maps of flood-prone areas and wetlands.

During the workshop, all the participants did acknowledge the urgency for improved collaboration between the MLGCA and other government MDA, NGOs, Civil Society Organizations, and Community-based Organizations (e.g., Watershed Committees) in addressing climate change issues in Seychelles. The DAs mentioned that existing frameworks could be enhanced to facilitate this collaboration. For example, they emphasized that the SNCCC is an important forum, and the active participation of the MLGCA will improve external cooperation significantly. Climate change issues are cross-cutting, and the composition of this committee includes different stakeholders, who meet at least once

every three months or more regularly as the need arises. This committee addressed climate change issues nationally and was instrumental in crafting Seychelles' Climate Change Policy and the National Climate Change Strategy, which is currently being updated. Therefore, the SNCCC is a think-tank that can facilitate collaboration and mediation between affected stakeholders and devise strategies and opportunities to enhance the effective implementation of the NAPs across sectors.

4.3. Financial Capital

Their inability to directly apply for funding was cited as the primary barrier preventing the DAs from implementing climate change projects in their respective districts. Almost 80% of the respondents stated that budget allocation at the MLGCA for climate change issues is minimal. Those opportune to have received funding were through the District Small Projects (DSP) budget. Due to the limited funds available, climate change adaptation activities have been essentially tree planting. The financial capital vis à vis the implementation of climate change projects by the DAs is influenced by multi-level governance, given that climate change adaptation is considered a national priority in Seychelles due to its vulnerability. Therefore, dedicated funds for climate change projects for the national government and external donors are often directed through the MACCE and other MDAs. During the workshop, funding for coastal management, adaptation, and disaster preparedness was ranked as high, moderate, and low, respectively (see Figure 5). In support of these rankings, DA's explained that most development has occurred along the coast. Thus, it justifies why coastal management is a crucial concern that attracts funding from the government and several international development agencies for project implementation.

An overall moderate ranking was agreed upon for adaptation because some districts argued that they benefit from climate adaptation projects implemented by the MACCE and other MDA with financial support from external funders. The Ecosystem-based Adaptation to Climate Change (EbA) project was one example of a project implemented by the MACCE across five districts on Mahe Island. Some EbA activities include rehabilitating degraded wetlands, mangrove restoration, river management, and tree planting in degraded forest areas. Funding for disaster preparedness received a low ranking because discussions on budget allocation often happen after a disaster. This suggests that disaster risk management is mainly reactive rather than proactive.

During the workshop, it was clear that the DAs could play a more significant role in climate change adaptation. This was mainly through co-designing projects where they could provide historical information about their respective districts. The DAs also emphasized local communities' education on environmental and climate change issues. For greater involvement of DAs in climate change adaptation, the workshop participants highlighted the need for close coordination with the MDA to avoid duplication of efforts. Although all DAs are aware of domestic funding opportunities (e.g., Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) and Environment Trust Fund (ETF)), the current administrative structure does not allow them to access funding directly. Therefore, the DAs can only access funding from such sources through NGOs. Participants felt these administrative bottlenecks should be removed to enable the DAs to access funding directly. Three of the DAs did mention that the just-completed EbA projects in which community members participated in wetland restoration will need to be maintained through the services of local contractors once every three months. To them, if DAs can apply for funding directly, they can contribute to ensuring that climate change adaptation projects are maintained to be sustainable over time, especially after projects are completed.

4.4. Human Capital

The human capital received one of the lowest evaluations, with only one district community council assigned an Environmental Officer. Such an arrangement benefitted only La Digue Island, which is considered not to have easy access to some MDAs. Otherwise, those DAs on Mahe and Praslin Islands benefit from their services. Although the MLGCA

has issues concerning human resource capacity for climate change adaptation, the resource put in place by the national government was responsible for the relatively higher 48% medium ranking. About 70% of DAs acknowledged external technical support to deal with climate change issues in their districts, especially the MACCE and the Landscape and Waste Management Agency (LWMA). For example, the DAs did mention that in the event of flooding in their respective communities, their role is to contact the Climate Change Adaptation Management Section (CCAMS) at the MACCE. This section works closely with the Seychelles Planning Authority and the DRMD to assess the situation and provide solutions. A timely response is essential given those physical planners, coastal engineers, and adaptation technicians are based permanently in other MDAs and not at the district community councils.

Regarding capacity building on climate change, few DAs had attended workshops on climate change, with little impact, given these workshops were just for a day. The lack of adequate capacity-building opportunities has resulted in a lack of know-how, inadequate guidance on technical reports, and implementation of key recommendations. The lack of know-how on climate-related issues requiring specialized skills is further compounded by high staff turnover, leading to the loss of expertise. Due to human resource constraints, it was proposed during the workshop that an Environmental Officer be assigned to each Regional Council. Such deployment will translate to 7 Environmental Officers instead of 27 for each district community council. This officer would be responsible for articulating climate change responses between the Regional Council and various MDAs. They will also seek collaboration with the National Government, NGOs, CSO, and other relevant stakeholders to assist in implementing specific actions. According to DAs, adopting the La Digue model can ensure reliability and influence information sharing between the DAs and other MDAs.

4.5. Political Capital

The political capital received the highest negative response rate of 77% (see Figure 5). Although all the district community councils have a contingency plan, these plans are ambiguous and specific to adaptation. Therefore, there are no climate adaptation plans and strategies at the district level, and district community councils lack an internal structure for taking charge of and coordinating climate change issues. National climate change strategies are more relevant in the case of Seychelles, in which the roles and responsibilities of the DAs and, by extension, the MLGCA are not clearly defined. Only 20% of the DAs interviewed claimed to have previously been able to participate in national-level decision-making processes on climate change.

During the workshop, the participants emphasized the lack of transparency and political support from the national government. To further support this, DAs also shared that often they are not aware of environmental or climate change projects implemented in their districts despite being regarded as the “gate holders” of their respective communities. About this, the general confusion in the roles and responsibilities between DAs and Members of the National Assembly (MNA) also came across as an issue of concern that often leads to conflict. Moreover, it became clear that the current roles of district authorities in implementing climate change adaptation policies and strategies were mainly facilitators.

4.6. Co-Developed Recommendations for Policy Measures to Enhance Climate Change Adaptation

A total of 10 policy recommendations were co-developed during the workshop to strengthen local governance for climate change adaptation (Table 1). These cross-cutting recommendations highlight that a siloed approach cannot effectively address climate change. For example, one of the recommendations stated that land-use planning should be guided by location-specific vulnerabilities as this differs across districts. Additionally, DAs actively engage in the decision-making process on climate change projects, especially those implemented in the respective districts (Table 1). Overall, seven of these recommendations partly address issues related to political capital. These recommendations and their relationship

to different types of capital are presented in detail in Table 1. These findings, supported in the climate change adaptation literature, address issues faced by local governance relevant to SIDS and other developing countries. All of these recommendations have been incorporated into the Seychelles National Climate Change Strategy which is currently undergoing revision. Being part of the climate change strategy, there are better assurances of their implementation.

Table 1. Co-developed recommendations for policy measures in Seychelles and validated with climate change adaptation literature.

#	Recommendations	Relation to Capital
1	To undertake a comprehensive review of relevant environmental and climate information to be provided to Districts to help them make better planning decisions, particularly those which effectively consider climate risks.	Human, Political
2	To adopt location-specific vulnerability assessments that would allow changes in land-use planning to guide each district on what climate information is needed to show its planning process.	Human, Political, Social
3	To establish a framework in which the ministry responsible for climate change will collaborate annually with the District Administrators to jointly identify their climate change priority for implementation.	Human, Social, Political
4	To assess the feasibility of employing Regional Environmental Officers responsible for environment and sustainability issues for each regional district. These officers would facilitate dialogue and coordinate actions across levels of government and other actors.	Human, Environmental
5	To consider the organization of annual local government adaptation summits and provide the opportunity to share information and best practice, identify challenges, and deliver specific training workshops.	Human, Environmental, Social
6	To embed climate action across levels of government to determine how National Government and Districts can best work together to manage the impacts of climate change and build community resilience.	Political, Social
7	To clarify the roles and responsibilities of Members of the National Assembly (MNAs) representing the districts and the District Administrators (DAs), given that the former sometimes step into the function of the latter, which causes conflict.	Political
8	To enhance the role of District Authorities alongside other relevant stakeholders in the monitoring and evaluating adaptation projects in their respective districts.	Financial
9	To establish/create a local governance structure that permits District Authorities to have the autonomy to directly access Climate Change Adaptation funding from domestic sources such as SeyCCAT and the Environment Trust Fund (ETF).	Financial, Political
10	To involve District Authorities in national decision-making processes on climate change, especially those concerning their district	Political

5. Discussion

The local governance assessment of district community councils in Seychelles identified the capacity needs of local governments for implementing climate change adaptation. In Seychelles, adaptation is a national priority, given the vulnerability of the island state to the impacts of climate change. Identifying local governance capacity needs for implementing climate change adaptation confirms the usefulness of the CAF as an analytical tool for evaluating local governance processes [19,38]. Tracking the progress in climate change adaptation is progressively recognized. However, it is somewhat arduous to do so due to the lack of a reference point from which progress could be assessed [55,56]. The use of CAF and co-development of policy recommendations provides an inclusive, coherent, and context-specific set of results aimed at mitigating the weaknesses in the current governance system so that long-term sustainability can be achieved [20]. Therefore, the discussion is presented in two sub-sections: (i) local governance assessment based on the CAF in Seychelles and (ii) the relevance of co-developed policy recommendations to enhance local governance of climate change adaptation in Seychelles and elsewhere. More importantly, the CAF, when compared to studies that have applied other methods, can enhance the implementation of climate adaptation at the local level, as demonstrated by studies from Mauritius and South Africa [19,20]. Multilevel governance has been the predominant

method regarding the local governance of climate adaptation, with a greater focus on politics rather than capacity assessment [26,28,32,33,57,58].

5.1. Local Governance Capacity Assessment for Seychelles

The impacts of climate change, such as flash floods, landslides, and salt water intrusion, in Seychelles have created a high level of awareness that has permeated into local governance authorities, enhancing the evaluation of the environmental capital. As a SIDS with over 90% of development along the coast, the Seychellois population is aware of these environmental changes, including those induced by climate change. Although the impact may vary from district to district, communities are aware of climate change issues in their locality—a view supported by previous studies [19,59]. Familiarity with climate change impacts at the local level is essential for implementing climate change adaptation in SIDS and other developing countries [60,61]. Livelihood activities such as tourism, fisheries, and agriculture in Seychelles depend on the environment's health. The Seychellois communities, including the DAs, are aware of these realities.

The primary statutory duty of the district community councils is to promote the sustainability of the Seychellois communities and the holistic development of its people. Achieving this objective would require collaboration with other MDAs, given that climate change is cross-cutting and cannot be addressed in isolation. While internal collaboration within the MLGCA was much more substantial, it was lower with other MDAs. Despite the active cooperation within the MLGCA, the focus was more broadly on development in general, as supported by another study [34]. One of the main reasons cited in the literature is that long-term planning and integration of climate change adaptation into national development strategies and action plans should apply a cross-sectorial approach, which is hardly practical in most cases [57]. The cross-sectorial dilemma in development planning stems from the lack of coordination mechanisms that can enhance effective collaboration. The resultant effect is the predominance of a more siloed approach that does not foster cooperation but instead reinforces multi-level governance bottlenecks, which, in turn, weakens the involvement of stakeholders, especially in the local government, in development planning and implementation. The Seychelles National Climate Change Policy recognizes the importance of an effective coordination mechanism. While this policy provides a National Climate Change Council that includes all relevant stakeholders, the proposed council is yet to be operational [16]. Therefore, a lack of policies is not usually the problem but rather an issue with policy implementation.

The DAs emphasized improved access to relevant and recent climate information in easily understandable formats that can support decision making for climate-proofing development. Greater access to such information by the DAs can be enhanced through collaboration with external stakeholders, which in our research requires tremendous improvement. Two studies from Mauritius and South Africa had similar findings, with weak local and national government cooperation [19,20]. Collaboration and stakeholder participation is essential because it enhances the exchange of knowledge and information and, more importantly, the wise use of resources, be it human, material, or financial resources [32]. Although there was greater collaboration within the MLGCA, it was less so with external MDAs, the key players in community development. An effective partnership does not occur by default but requires a well-organized institutional setup that enhances the active participation of relevant stakeholders. However, the top–bottom approach and multi-level governance are still a change in most developing countries [62], including Seychelles. Promoting a holistic approach to climate change adaptation could improve collaboration among stakeholders [51] and avoid the duplication of efforts while identifying synergies in development projects [55,63].

Despite the risk faced by districts, our financial and human capital findings revealed that local authorities lack the legal mandate, resources, and technical know-how to implement climate change adaptation successfully. Direct access to funds for climate change adaptation by the DAs occurs through the District Small Projects (DSP) budget allocation

at the MLGCA. The insufficient budget has supported some district community councils implementing tree-planting activities. Furthermore, the current administrative structure does not allow the DAs to access funding from domestic sources such as SeyCCAT and ETH. According to the DAs, such financing can be accessed through NGOs, who might also have priorities that are not aligned with pressing issues in communities. Another proxy to access to finance is the lack of technical skills across the project cycle from grant application, implementation, and reporting. These were some of the issues raised by the DAs that further limited their access to finances for climate change projects.

Financial support and capacity development are key challenges to implementing climate change adaptation, and dealing with climate risks requires specialized knowledge and skills [64]. In multi-governance systems, the distribution of competencies and the general reliability of professionals are common barriers [26]. SIDS is particularly well-known to have staff with inadequate training and know-how to implement recommendations from higher levels of governance [62]. Much of the current human resource capacity for climate change adaptation in the districts is provided by the national government and relevant MDAs. However, DAs argue that more monitoring and evaluation are required over the work of current MDAs to assess their effectiveness and reliability in terms of employing systematic as well as an evidence-based mechanism for adaptation [34].

While costs for different climate change adaptation projects are outlined in the Updated Nationally Determined Contribution of Seychelles [18], funding requirements are barely discussed in national strategies and action plans. To fulfil their obligations, district community councils urgently require financial support and capacity development to increase technical knowledge and process-oriented skills such as inclusive facilitation, monitoring, and evaluation of policies and measures [19,65]. Local government participation fosters community engagement, which can increase ownership of projects and sustainability—an approach that promotes international development agencies [2,25].

Findings for political capital showed a lack of support and transparency from the national government, which sometimes resulted in conflicts between DAs and MNAs. District community councils are not provided with the appropriate legislative tools. They are thus unable to adequately address the concerns of their communities, particularly those affected by flash floods, saltwater intrusion, coastal erosion, landslides, and other climate-related impacts, which are projected to increase significantly. Political capital is instrumental in achieving good governance, considered an essential pre-requisite for achieving the United Nations Sustainable Development Goals [20].

All the co-developed policy recommendations further indicate that climate change, even at the local level, cannot be addressed by a specific sector but requires a cross-sectorial approach that fosters stakeholder partnership (Table 1). However, local government should be allowed to play a vital role in developing their communities, given their ability to provide local knowledge and general leadership roles in society. The active participation of DAs is even more crucial in addressing climate change adaptation in Seychelles, as some of the impacts, such as coastal erosion, flooding, and landslides, are transboundary. An earlier study showed that increased responsibility of local governance actors in dealing with transboundary issues has proven helpful in enhancing overall local capacity [58].

Limited access to climate information to DAs is a significant problem. Although climate information might be received upon request, it is often in a format that is not easy to use. Being critical focal persons in the respective districts, DAs urge relevant MDAs to be more inclusive with such information to better assist the people from their communities. Acquiring access to pertinent and digestible information about emerging and past environment and climate change information, relevant climate risks, proactive adaptation measures, and successes and failures can substantially increase the resilience of communities to climate-induced impacts [34,38,66].

Climate change policies and strategies that consider the adaptation actions that will enhance the resilience to climate change are well documented in Seychelles. Some of these policies and procedures include climate change policy, climate change strategies,

sustainable development strategies, and NDCs [8,16–18,67]. However, there is still a lack of detail about the role of local governments in addressing climate change adaptation, which was apparent in our research. The overriding priority of national compared to local interest in planning policy processes is reportedly viewed as a factor that decreases the effectiveness of multi-level governance systems [26]. The building of local institutional capacities should be prioritized in agenda-setting forums to enhance climate resilience, as recommended by Mycoo and Donovan [68].

The local governance assessment revealed that climate change adaptation in Seychelles is designed and enacted as a top-down process. However, this top-down process is impractical and inappropriate in SIDS and other developing countries due to the lack of resources at the local level to enforce legislation [19,60] effectively. Enhancing capacities to lend greater autonomy to local authorities is even more critical in climate change adaptation, as decentralization is essential for improved cooperation and decision making [19,21,59]. In principle, the mandate of the MLGCA indicated that they should play a more significant role in local development. In practice, however, there was a divergence regarding the actual implementation of climate change adaptation by the district community councils. These opposing views raise a question concerning the extent of an enhanced role of district community councils in climate change adaptation. While some have argued that DAs should focus primarily on raising awareness in local communities about climate risks, some representatives from the National Climate Change Committee viewed district community councils as the appropriate entity to initiate climate change adaptation actions. The challenge remains that of competencies and resource availability common in multi-level governance systems—a view supported by Di Gregorio et al. [26].

5.2. Importance of Co-Developed Recommendations for Policy Formulation in Other Developing Countries

The proximity between national and local tiers of government, combined with constraints in terms of size and resources, can often lead to power imbalances between the different levels of governance [69]. The dominance of national over local interests in policy planning has decreased the effectiveness of multi-level governance [26]. Even the effective implementation of the Sustainable Development Goals (SDGs) requires a robust framework that will allow for multi-stakeholder engagement and coordination at all levels of governance [70]. This explains why the multi-level governance approach has gained traction in addressing environmental issues, especially climate change, at different levels of society. Climate change adaptation, for example, cannot be addressed successfully at any geographic scale or by any actor category [71]. Climate adaptation needs to be mainstreamed, and institutional networks must be strengthened for adaptation mechanisms to be effectively implemented [72].

The policy recommendations (Table 1) cover several issues inherent in most developing countries, especially the hierarchical manner in which government works and issues linked to finance, which have a bearing on material and human resource capacity. One issue raised is the need to clarify the roles and responsibilities of Members of the National Assembly (MNAs) representing the districts and the District Administrators (DAs). Further to this recommendation were reported instances in which the MNAs assumed the responsibilities of DAs, leading to conflicts. Local governance in developing countries is subject to various political and operation constraints, partly due to overlapping mandates on the one hand and the other hand, poor enforcement and coordination. In South Africa, the city of Johannesburg, Cape Town, and Durban did develop distinct climate actions within their jurisdictions because of the absence of a coherent national climate policy. However, the effective implementation of these climate actions is hindered by political and economic barriers [73]. Corroborating this view, Vedeld et al. [69] emphasized that effective collaboration across politico-administrative boundaries at multiple scales is required to address tensions between competing policy agendas.

Another focal area in the recommendations is human resource capacity, which was associated with 5 of the ten recommendations (Table 1). Human resource capacity can be influenced by population and availability of financial resources to provide the required training needed in climate change. Capacity needs in SIDS have received limited recognition from international development agencies. The resultant effect has been staff that lacks appropriate training and technical capability to implement recommendations from higher levels of governance [62]. This is compounded by a lack of organizational structure that often hinders collaboration and cooperation on climate issues. An environmental officer is available for the DA in La Digue Island, which is recommended for each regional council. These officers will facilitate dialogue and coordinate actions across levels of government and other actors on climate change (Recommendation 4, Table 1). Installing climate change officers has been beneficial in two studies conducted in South Africa [74,75]. For effective local governance systems to decrease the vulnerability of SIDS, it was recommended to embed climate action across levels of government and to determine how National Government and Districts can best work together to manage the impacts of climate change and build community resilience (Recommendation 6, Table 1).

Climate finance is at the core of adaptation, and SIDS and other developing countries require financial assistance to adapt to the impacts of climate change [4]. In 2009, developed countries pledged to mobilize US\$100 billion annually by 2020 in climate finance to developing nations, which was not met [76]. This pledge is considered a broken promise, and steps to fix it have been proposed [77]. Given their vulnerability to the impacts of climate change, the Alliance of Small Island States (AOSIS) emphasized climate finance's role during the 2018 Katowice Climate Change Conference [78]. Such a position by AOSIS resonates with the adaptation deficit between developed and developing countries [79]. Enabling access to financial resources at the local level could facilitate adaptation actions and strengthen horizontal and vertical integration of climate change through multi-level governance—a view supported by two previous studies [19,80,81]. The current administrative procedure in Seychelles only allows DAs to access funds through NGOs, not directly from the donors. Another study found that to enhance access to financial support mechanisms, local actors would require external support to address issues around eligibility and procedure [4]. The need for a revised administrative process will give District Authorities the autonomy to directly access Climate Change Adaptation funding from domestic sources such as SeyCCAT and the Environment Trust Fund (ETF) (Recommendation 9, Table 1). However, Williams et al. [19] cautioned that this has to occur in close coordination with higher levels of governance to identify priorities and ensure projects align with national adaptation strategies.

6. Conclusions

The profound impact of climate change on the operating space of local governance structures in Seychelles can be likened to most developing countries, where effective multi-level governance to climate adaptation is yet to be achieved. Different actors in Seychelles play a role in climate adaptation at the local level and can be grouped as state and non-state actors. The notion that Seychelles is a SIDS with a land size of 455 km² could be misleading, because small size does not translate to less significant issues for local governance in terms of climate change adaptation. This is because the local government capacity needs for effective climate change adaptation are similar in most instances, even for other developing countries. Therefore, the CAF identified capacity needs across the five capital. The CAF provides a baseline to drive discussions on how to strengthen local governance and recognizes where more efforts are needed to enhance the adaptation process at the local level. This approach is also helpful for monitoring progress over time. The co-developed policy recommendations have been incorporated into the ongoing revision of the National Climate Change Strategy. These recommendations that are now part of the revised climate change strategy have the potential to foster multi-level governance while concomitantly ensuring practical adaptation actions at the local level. Given that over

90% of Seychelles' development has occurred along the coast, future studies that assess local coastal governance based on the CAF are recommended.

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Appendix A

Table A1. Indicators used to assess the performance of factors and types of capital.

Capital types	Factors	Indicators
Social Capital	S1: External collaborations	Organizes 4 to 5 meetings annually on development issues
		Climate change issues are discussed during meetings
		Exchange of environmental and climate change information among DAs
	S2: External collaborations	Participate in a meeting annually organized by the SNCCC
		Invited by the national government to contribute to climate policies and strategies at least once a year
		Collaborate with other MDAs for projects implemented in districts
S3: Information sharing on climate change	Know which MDAs to contact for climate information	
	Climate information is available in formats that are useable at the district level	
	Historical data that can support climate adaptation is available at the MLGCA	
Political Capital	P1: Political support and leadership on climate adaptation	Current political support is effective in driving climate adaptation in the various districts
		The MLGCA is part of the leadership for climate change issues
		The responsibilities of local government for the implementation of climate change are specified in national development plans and strategies
	P2: Regulatory framework	A national coordination mechanism for climate change does exist
		The national coordination mechanism regularly monitors and evaluates the implementation of climate change projects
		The DAs are part of the monitoring and evaluation of climate projects in the respective districts

Table A1. Cont.

Capital types	Factors	Indicators
Human Capital	P3: Transparency	DAs are aware of the national government's position on climate change
		The national government provides the DAs with information annually from decisions reached at the Conference of Parties (COP)
		The DAs participates in decision making on climate change nationally
	H1: Leadership	Those leading climate change nationally have the required capacity
		Consultants are needed to support leadership in climate change nationally
		Multi-level governance arrangements are practical even at the local government levels
	H2: Human resource capacity	DAs have the required technical skills to engage in climate change adaptation projects effectively
		Mainstreaming climate adaptation into local development is understood by the DAs
		The DAs have the technicalities to support the national climate change policy design process
	H3: Access and usability of climate information	DAs know where to access climate information
		The DAs know how to integrate local knowledge with scientific knowledge for climate adaptation
		Available climate information can be interpreted and used by DAs for climate change in their respective districts
Financial Capital	F1: Funds for adaptation	DAs can access funds for adaptation projects outside of Seychelles
		DAs can access funds for adaptation projects within Seychelles
		Accessing funds for adaptation is through another party for the implementation of adaptation projects in the districts
	F2: Funds for coastal management	DAs can access funds for coastal management projects outside of Seychelles
		DAs can access funds for coastal management projects within Seychelles
		Accessing funds for coastal management is through another party for the implementation of adaptation projects in the districts
	F3: Funds for disaster preparedness	Each DA has an allocation of a budget for disaster preparedness
		Funds for disaster preparedness are channeled only through the Disaster Risk Management Division (DRMD) Seychelles
	F4: Ability to mobilize funds	DAs can apply for climate adaptation funds from the MLGCA
		DAs can apply for climate adaptation funds from domestic sources such as SeyCCAT and ETF
		DAs can mobilize funds for adaptation projects through NGOs
	Environmental Capital	E1: Importance of ecosystems to the nation's economy
Seychelles encompasses some of the richest fishing grounds in the world		
Ecosystem goods and services do support tourist attractions in Seychelles		
E2: Drivers of environmental degradation		Land reclamation for housing is fast degrading the environment
		An increase in tourism establishments is the leading cause of environmental degradation
		Invasive alien species are fast degrading the forest ecosystems
E3: Climate change adaptation measures		Only hard engineering adaptation measures are implemented across districts
		Only soft adaptation measures are implemented across districts
		Both hard and soft engineering measures are implemented across districts

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