

Cities, Climate Change Adaptation
and Sustainable Development:
The Role of Local Governments in
Commonwealth Small Island
Developing States



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Foreword

The climate crisis is universal, but its effects impact countries in very different ways. In her paper *Cities, Climate Change Adaptation and Sustainable Development: The Role of Local Governments in Commonwealth Small Island Developing States*, Prof Mycoo considers the particular vulnerabilities of small island developing states in the Caribbean and the critical importance of involving and empowering local governments, especially in an urban context, in climate adaptation and mitigation.

She draws on her extensive research into the impacts of climate change, especially in small island developing states (SIDS), to contextualise climate change globally, but also at the national and local level from a specifically SIDS perspective. In doing this, she highlights especially the role that government, including local government, can and does play to protect citizens, and suggests ways in which this engagement could be deepened; She thinks about global trends and their impact on communities in SIDS from the perspective of local government, ranging from infrastructure provision to health, vector borne disease control and economic development; she focuses in on the challenge of climate change alongside the already significant vulnerabilities of SIDS; highlights some of the cross-cutting issues which impact on the response to climate change; and finally draws on examples of good practice from across the Commonwealth in ensuring that opportunities are taken to build back better after the COVID19 pandemic.

In doing this, Prof Mycoo makes a very clear case for ensuring local communities are at the centre of managing, adapting and mitigating the impacts of climate change and the role of local government in enabling that. She also recognises the urban nature of the Caribbean and the realities of informality in cities and towns across the region. The importance of investing in and strengthening the enabling conditions for a localised and targeted response, namely legislation, governance, and planning, are highlighted. In conclusion she suggests a broad cross section of measures, building on the experiences of the region, that must be embraced. Using local knowledge and experience to ensure

ecosystem-based solutions should, she proposes, go hand in hand with investment in local capacity, infrastructure and planning. It is very clear that access to finance will be critical to successfully managing the impacts of climate change in small states in the Caribbean, and elsewhere, as well as the use of technology and the ability of all stakeholders to build the partnerships for development envisaged in SDG17.

The paper draws on some of the outcomes of CLGF's recent regional meeting held in Barbados, June 2022. It chimes strongly with CLGF's work to highlight the importance of a greater Commonwealth focus on sustainable urbanization at the forthcoming Commonwealth Heads of Government Meeting in Kigali, June 2022. Cities are major producers of greenhouse gases, they are also where the majority of citizens live in the Caribbean and empowered local government, able to focus on planning and delivery, will ensure that citizens are part of that process.

Sustainable urbanisation and climate change are two key priorities for CLGF members. We would like to warmly thank Prof Mycoo for her very practically focused paper, which I know will be of interest to members across the Commonwealth, and which we will ensure underpins and informs CLGF's climate related initiatives.

Lucy Slack
Secretary General

Introduction

Cities of the Commonwealth Small Island Developing States (SIDS) face unprecedented challenges in addressing major issues of sustainable development, sustainable urbanisation, climate change and socio-economic recovery post-COVID 19. From as far back as 1992, at the United Nations Conference on the Environment and Development in Rio de Janeiro, Brazil, they elevated their voices to have a special meeting in Barbados to discuss a plan of action given their unique characteristics and challenges they faced in attaining development which would fulfil the needs of current and future generations living in small states. They continued to participate in United Nations meetings held in Mauritius and Samoa in 2004 and 2014 respectively, to ensure that they were actively engaged in articulating what sustainable development entailed for small islands. In 2015, SIDS committed to fulfilling the United Nations 17 sustainable development goals (SDGs) by 2030. However, in meeting these SDGs, SIDS face significantly different challenges unlike territories with larger land masses, more robust economies, and high levels of human capacities. These complex, interrelated challenges include geographical remoteness, fragile ecosystems, natural resource dependent economies, increasing debt, vulnerability to external economic shocks, human and technological resource constraints, limited capacity to mobilise investment, limited planning, implementation, monitoring and enforcement capacity, along with rapid and burgeoning informal urbanisation. These factors not only undermine SIDS potential to achieve sustainable development and sustainable urbanisation, but also their adaptation to climate change and efforts aimed at COVID-19 recovery.

A contextual understanding of challenges associated with climate change (SDG 13), the creation of safe, inclusive, sustainable, resilient cities and human settlements (SDG 11), good health and well-being (SDG 3), gender equality (SDG 5) and partnerships to attain the SDGs (SDG 17), and enabling opportunities for addressing them, is presented in this paper. Local government's role in responding to climate change impacts

and unsustainable urbanisation is increasingly important.

This paper will explore how cities and local governments in Commonwealth SIDS can respond to difficult sustainable development issues, both individually and within their wider national governance frameworks, as well as how international networks such as the Commonwealth Local Government Forum can support its members to better respond to these challenges, including building the necessary partnerships to provide safe, inclusive, sustainable, resilient cities and communities.

The paper will specifically:

1. Examine the specific vulnerabilities faced by Caribbean SIDS and the role that local government can and does play to protect its citizens within this context;
2. Discuss climate trends and their impact on SIDS local communities, in relation to the role and responsibilities of local government, such as infrastructure provision, flood mitigation, improving food security, environmental health and vector-borne disease control, disaster management, facilitating local economic development as part of the sustainable development agenda;
3. Examine climate change trends and impacts which will be further framed within the context of the specific challenges faced by SIDS, such as remoteness, increasing debt, limited capacity to mobilise investment, limited planning and implementation capacity, rapid and informal urbanisation;
4. Highlight specific cross-sectional issues such as gender and climate change, inequalities, and youth; and
5. Draw on experiences from small states across the Commonwealth, share innovations and highlight opportunities to 'build back better' in the context of a climate change and COVID-19 recovery.

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report of the Working Group II on Impacts, Vulnerability and Adaptation confirmed that Small Islands face multiple challenges driven by climate change and anthropogenic factors. The scientific assessment report (2022) stated that “Small islands are increasingly affected by increases in temperature, the growing impacts of tropical cyclones, storm surges, droughts, changing precipitation patterns, sea-level rise (SLR), coral bleaching, and invasive species, all of which are already detectable across both natural and human systems” (Mycoo et al., p.3, 2022). SIDS local governments are facing these multiple climate change impacts in cities and settlements that fall within their jurisdiction and are increasingly being tasked to respond to natural hazards and deploy resources for planning, preparedness, emergency efforts and post-recovery initiatives in their communities.

Impacts of Climate Change: Observed and Projected

Recent studies highlighted that observed extreme sea level events causing extensive flooding generally resulted from compound effects, i.e., the combination of SLR with Extreme Tropical Cyclones, Tropical Cyclones (TC) and tropical depressions (Seneviratne et al., 2021). On tropical islands with high elevations, major floods frequently occurred during TC events, due to the cumulative effects of storm surge and river flooding, the impacts of which were exacerbated by human-induced changes to natural processes in urban areas. This for example occurred in 2015 (TC Pam) in Port Vila, Vanuatu, where urbanisation and human-induced changes to the river exacerbated flooding (Rey et al., 2017). Successive tropical depressions generating heavy rains also caused extensive flooding, for example in 2012 in Fiji (Kuleshov et al., 2014) and in 2014 in the Solomon Islands (Ha'apio et al., 2019).

SIDS are highly impacted by more intense tropical cyclones as growing evidence confirms. Over the last five years, some small islands located in the Caribbean and Pacific have experienced Categories

4 and 5 TCs which have caused unprecedented loss and damage to settlements and infrastructure (See Figure 1). TC Maria in 2017 destroyed nearly all of Dominica's infrastructure and losses per unit of GDP amounted to more than 225% of the annual GDP (Eckstein et al., 2018) (See Figures 1 to 3). Destruction from TC Winston in 2016 amounted to more than 20% of Fiji's current GDP (Cox et al., 2018). Additionally, living conditions in human settlements are changing due to storm surge which is already penetrating further inland compared with a few decades ago (IPCC, 2018; Brown et al., 2018a). These losses and damages are a burden to SIDS confronted by heavy debt and rising unemployment further exacerbated by COVID-19.

Future climate change impacts for SIDS are likely to be significant if global warming cannot be limited to 1.5°C above pre-industrial levels.



Figure 1: Tropical Cyclone over the Caribbean



Figure 2: Damage and Loss in SIDS (Dominica)

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Studies have revealed that projected climate and ocean-related changes will significantly affect marine and terrestrial ecosystems and ecosystem services, which will in turn have cascading impacts across both natural and human systems (Mycoo et al., 2022). Projected changes in wave climate superimposed on sea level rise (SLR) will exacerbate coastal flooding. The frequency, extent, duration and consequences of coastal flooding will significantly increase from 2050, unless coastal and marine ecosystems are able to naturally adapt to SLR through vertical growth.

Island Settlements and Infrastructure

Settlements and infrastructure of small islands are at growing risk due to climate change due to slow onset ocean and climate changes and changes in extreme events, if feasible adaptation measures are not implemented and continuously monitored. It has been observed that ocean acidification and deoxygenation, increased ocean temperatures and relative sea level rise are impacting marine, coastal and terrestrial biodiversity and ecosystem services, making settlements more exposed and vulnerable to climate-related hazards. Changes in rainfall patterns such as heavy precipitation result in annual flood events that damage major assets and result in a loss of human life. Examples of cities in SIDS where this has occurred are Kingston (Jamaica) (Taylor et al., 2014), Port of Spain (Trinidad and Tobago) (Mycoo, 2014a; Mycoo, 2018b), Georgetown (Guyana) (Mycoo, 2014), Viti Levu (Brown et al., 2017; Singh-Peterson and Iranacolaivalu, 2018), urban areas of Fiji and Kiribati (McAneney et al., 2017; Cauchi et al., 2020), and Male', Maldives (Wadey et al., 2017). See Figure 4.

As coastal entities with limited land area, coastal capital cities were common in SIDS with the majority of them playing a key role in trade and commerce during the colonial era. Today, the main settlements of small islands are located along the coast and with decades of high density coastal urban development, their population, buildings and infrastructure are currently exposed to multiple climate change-related hazards (Kumar and Taylor, 2015; Mycoo, 2017). These changes are a major concern for small islands given that a high percentage of their population, infrastructure and economic assets are in the low elevation coastal zone (LECZ) which comprises land below 10



Figure 3: Damage to Building Stock (Dominica)



Figure 4: Flooding in Port of Spain Central Business District, Trinidad

metres elevation. Approximately 22 million in the Caribbean live below 6 metres elevation (Cashman and Nagdee, 2017). In the Solomon Islands and Vanuatu, over 60% of the population lives within 1 km of the coast (Andrew et al., 2019). Most Pacific islands have $\geq 50\%$ of their infrastructure within 500 metres of the coast (Kumar and Taylor, 2015), and in Kiribati, Marshall Islands and Tuvalu, $>95\%$ of the infrastructure is in the LECZ (Andrew et al., 2019).

Future impacts of climate change may worsen for many SIDS due to their high vulnerability and exposure. TC intensification in the future is likely to cause severe damage to human settlements and infrastructure in small islands. Based on SLR projections, almost all port and harbour facilities in the Caribbean will suffer inundation in the future (Cashman and Nagdee, 2017). In Jamaica and St Lucia, SLR and extreme sea levels are projected to be key risks to transport infrastructure at 1.5°C unless further adaptation is undertaken (Monioudi et al., 2018). Similar findings were reported for Samoa (Fakhrudinn et al., 2015). Even islands of higher

elevation are expected to be threatened, given the high amount of infrastructure located near to the coast, for example Fiji (Kumar and Taylor, 2015).

Human Health and Well-being

Climate change is the biggest global health threat of the 21st century and small islands in particular face disproportionate health risks associated with changes in temperature and precipitation, climate variability, and extremes. Climate change is projected to increase climate-related health risks (Weatherdon et al., 2016; Ebi et al., 2018; Schnitter et al., 2019). Health risks can arise from exposures to extreme weather and climate events, including heatwaves; changes in ecological systems associated with changing weather patterns that can result, for example, in more disease vectors, or in compromised safety and security of water and food; and exposures related to disruption of health systems, migration, and other factors (McIver et al., 2016; Mycoo, 2018b; World Health Organisation, 2018).

Extreme weather and climate events, particularly TCs, floods, drought, and heat waves can cause injuries, infectious diseases, and deaths (Schütte et al., 2018). For example, category 5 TC Winston hit Fiji in 2016 and data revealed 34,113 cases of the nine syndromes among 326,861 consultations in a population of about 900,000; 48% of cases were influenza-like illnesses, 30% were acute watery diarrhoea, and 13% were suspected cases of dengue. Approximately 583 cases of Zika-like illness (1.7% of all cases) and two large outbreaks of viral conjunctivitis (total of 880 cases) were recorded. TCs also can affect treatment and care for people with non-communicable diseases, including exacerbation or complications of illness and premature death (Ryan et al., 2015).

Urban heat islands are likely to occur in cities where trees, which have a cooling effect, are being cleared to make way for buildings, port and road infrastructure. Examples in the Caribbean and Pacific exist of mangrove and swamp clearance which form part of land reclamation activities to create land for city expansion. Heat-related mortality and risks of occupational heat stress in small island states are projected to increase with higher temperatures (Hoegh-Guldberg et al., 2018; Mendez-Lazaro et al., 2018). Higher temperatures also can affect the productivity of outdoor workers (Taylor et al., 2021).

Tropical and sub-tropical islands face risks from vector-borne diseases, such as malaria, dengue fever, and the Zika virus due to climate change. Projections suggest more individuals in the Caribbean will become at risk of dengue fever by the 2030s and beyond because of an increasing abundance of mosquitos and larger geographic range (Ebi et al., 2018). Projected increases in mean temperature could double the dengue burden in New Caledonia by 2100 (Teurlai et al., 2015).

Waterborne diseases are likely to increase in SIDS where there is a high dependence on aquifers and rainwater harvesting, particularly atolls, coupled with overcrowding, population growth, and contamination (McIver et al., 2014; Strauch et al., 2015; McIver et al., 2016). For example, seasonal rainfall in Kiribati is associated with waterborne disease such as diarrhoea, cholera, and typhoid fever. Future projections indicate increases in the number of days of heavy rainfall by 2050, suggesting future increases in risk in heavily populated areas (McIver et al., 2014). Damage to water and sanitation services can cause infectious disease outbreaks, such as cholera.

Evidence is emerging of the mental health impacts of climate change. Tuvaluans are experiencing distress because of the local environmental impacts caused or exacerbated by climate change, and by hearing about the potential future consequences of climate change (Gibson et al. 2020).

With so much at stake, SIDS local governments should have a better understanding of SDG 13, the impacts of climate change and what implications they have for budgetary allocations as well as human and technological resources to efficiently perform their legal roles and responsibilities at the community level, especially in the relation to health, public safety and disaster response.

Sustainable Development and Sustainable Urbanisation

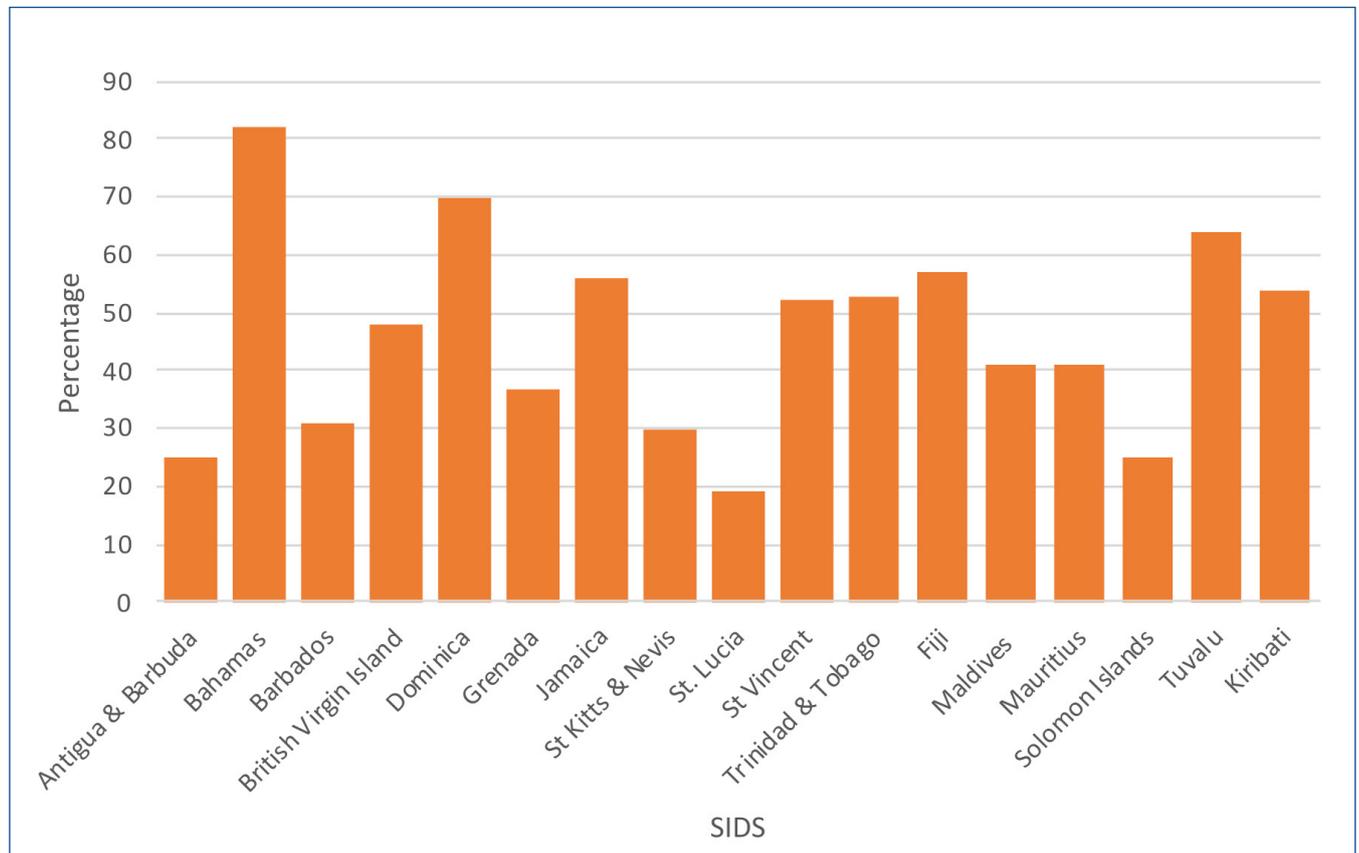
SIDS are experiencing rising urbanization levels, but it is the rapid rate of urbanisation which is a major concern among urban policymakers and practitioners. Rapid urbanisation, without a commensurate increase in the provision of services to meet basic population needs, compromises the attainment of SDG 11. The pivotal role of SIDS local governments in meeting UN SDG 11 merits a thorough review of drivers of urbanisation, impacts and a way forward in securing sustainable development over the long term.

Population increase in urban settlements is occurring due to natural increase as well as migration from lagging rural areas to the capital city. The main drivers of rural urban migration are unemployment, poverty and a lack of access to basic services. In recent times, however, population is migrating to secondary towns because of inflated land values in the capital city. For example,

population is moving away from Bridgetown and the urban corridor in the case of Barbados (Downes et al., 2015) and the dominance of the primate city of Kingston is slipping as population migrates to other towns, including Spanish Town and Portmore (McHardy and Donovan, 2016).

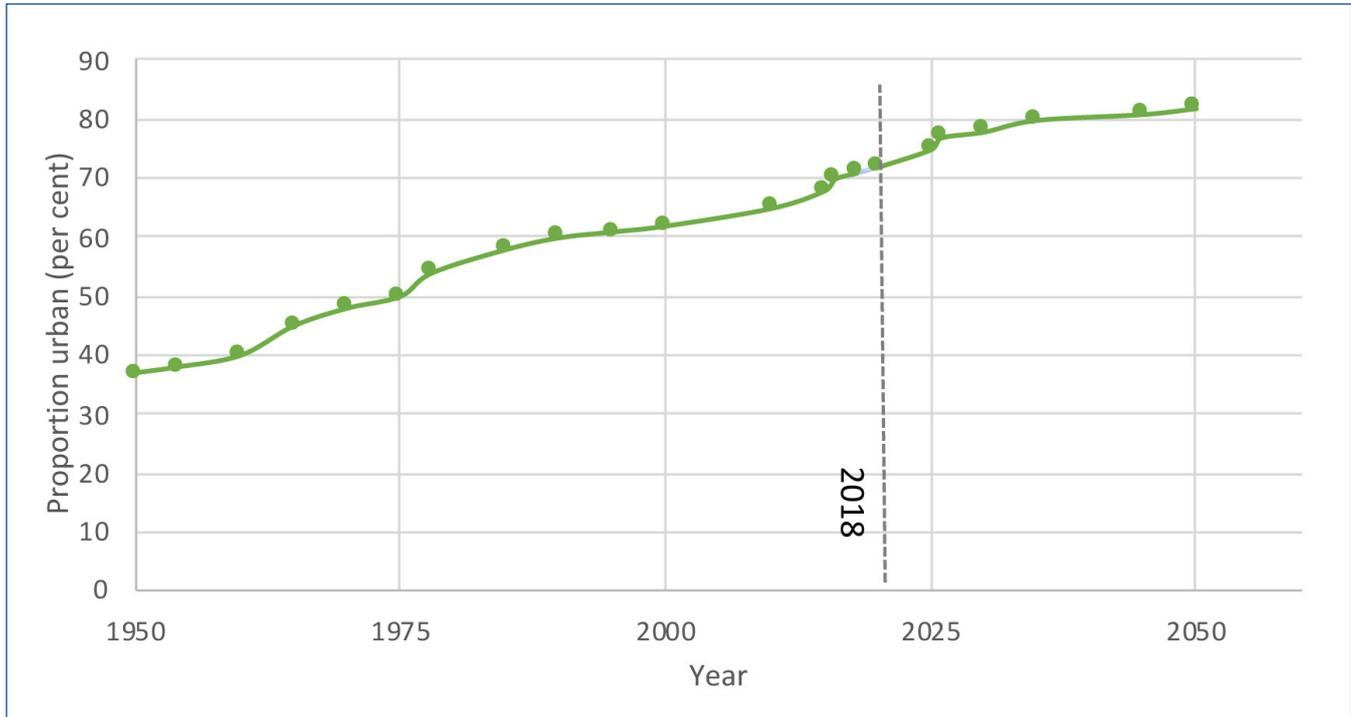
Approximately 72% of the Caribbean's population lives in urban areas according to the UN Department of Economic and Social Affairs (UN DESA, 2018). Within the Commonwealth Caribbean there are variations in urban population, but the demographic data shows that urbanisation levels are high. The Bahamas and Dominica have high urbanization levels with over 70% of their population living in urban settlements whereas in Jamaica, St. Vincent and the Grenadines, and Trinidad and Tobago over 50% of the population lives in urban areas. Despite such data, measuring urbanization remains a challenge

Figure 5: Total Percentage Urban Population in Selected Caribbean and Pacific SIDS (2020)



Source: Data from UN DESA, 2020

Figure 6: Percentage Urban Population in the Caribbean 1950-2050



Source: Data from UN DESA, 2020

as figures vary according to the delineation of urban settlements used by countries and the estimates their governments provide to UN DESA. For example, Trinidad and Tobago's National Spatial Development Strategy (2012) estimates that 72% of its population lives in urban areas and Barbados's urban population is defined as 70% in the 2017 Physical Development Plan (Government of Barbados, 2017).

The level of urbanisation in the Pacific SIDS is lower than the Caribbean as 39% of the Pacific SIDS population lives in urban centres (World Bank, 2020). As shown in Figure 5, the urban population in 2020 was 57% Fiji, Tuvalu 64%, Kiribati 56%, Maldives 41%, Mauritius 41%, Nauru 100%, in contrast to the Solomon Islands where it was as low as 25%. Despite their comparatively lower urban population many Pacific Island countries (PICs) are currently experiencing urbanisation rates more than three times the global average (UN-Habitat, 2015). Solomon Islands has the highest urban average annual increase rate at 4.33 per cent per annum (2010 to 2015) which represents a doubling time of only 16 years if it is sustained (UN DESA, 2018).

According to population projections the Caribbean and Pacific SIDS face an urban future. Urbanization in the Caribbean is occurring at a rapid rate and

projections up to 2050 indicate that will be the trend over the next three decades (See Figure 6). This forecasted trend is based on projections that as much as 80% of the Caribbean's population will live in cities by 2050 (Donovan and Turner-Jones, 2017). The Caribbean's urban population is growing two to three times faster than the current average in South America (Donovan, 2014). Jamaica's population will grow at an even faster rate in the future; while slightly over half of Jamaica's population is urban, by 2050 two out of three Jamaicans will live in cities (Donovan, 2014; UN, 2014) and Antigua and Barbuda, Barbados and The Bahamas will triple their rate of urbanization (UN-Habitat, 2015). Urban growth is expected to continue in all but a few Pacific SIDS, and for many, the rates are likely to be very high. By the mid-21st century the region will have an urban population approaching 6 million people (31% of the total population) (Campbell, 2019).

Development, Climate Change and Urbanisation

SIDS are exhibiting symptoms of unsustainable urbanisation which hinder sustainable development. This section deals with the impacts of land use planning, informal urbanism and climate change on sustainable urbanisation and sustainable development.

Land use planning

Sustainable development challenges including insufficient land use planning and land use competition contribute to increased vulnerability of human settlements to climate change in small islands (Kelman, 2014; Mycoo, 2021). In many Caribbean and Pacific SIDS, vulnerability to climate change and natural hazards is made worse by anthropogenic drivers such as ill-informed land use practices. As an example, satellite imagery data for Trinidad revealed that 50 per cent of original wetland was lost because of land use competition from urban land reclamation projects which were implemented to support industrial development and infrastructural provision. The Borough of Chaguanas is highly vulnerable to flooding, yet lands have been approved for private and public sector housing and commercial development. The state has made major investments in drainage to reduce flooding. Flash flooding, largely due to increased urban runoff are common throughout the Borough during the rainy season. The Municipal Development Plan for Chaguanas prepared by Mycoo et al., (2010) noted that the problem is compounded by inadequate and clogged drainage systems and water courses, poor maintenance of drains and culverts and river channels, indiscriminate dumping of garbage into waterways, and land use changes. In Fiji, approximately 10% of Viti Levu's landmass is within the high-risk zone for flooding, and these are mainly within proximity to waterways (Wainiqolo and Varo, 2020). Moreover, urban centers and approved land development are concentrated in this high-risk zone.

Informal urbanism

A complex settlement pattern is the growing percentage of the population in small islands living in informal settlements which occupy marginal lands leading to increased population exposure and vulnerability to climate-related hazards (Mycoo and Donovan, 2017). Throughout SIDS, unplanned settlements have compounded flooding brought on by slow onset hazards such as coastal and riverine flooding and fast onset events such as TCs and storm surges (Butcher-Gollach, 2015; Chandra and Gaganis, 2016; Mycoo, 2017). Unsustainable land use practices and difficulties in enforcing land use zoning and building guidelines in informal settlements make them highly vulnerable to such events (Mecartney and Connell, 2017; Mycoo, 2017; Mycoo, 2018b;

Butcher-Gollach, 2018; Mycoo 2021). Unauthorized occupation of sensitive terrain in SIDS undermines the role of ecosystems in providing services such as watershed management, erosion control and flood mitigation. Furthermore, high costs are incurred in building engineered infrastructure as part of informal settlement upgrading in these vulnerable locations. Local government's role in curbing the growth of squatter settlements and upgrading of basic services is stymied by central government. However, spontaneous settlements add pressure on local governments to deliver services such as such as solid waste collection, flood mitigation and disaster response.

In Trinidad and Tobago, an estimated 85,000 squatter households currently exist with over 396 squatter sites located on state lands. Approximately 55,000 households occupy public lands and an additional 30,000 households have encroached on private lands (Rajack and Frojmovic, 2016). Available evidence confirms that fewer affordable houses are being built for low-income households (Rajack and Frojmovic, 2016). In 2014, more than half of the demand for public housing came from low-income households earning less than TT\$4,000 (US\$615) per month (Government of Trinidad and Tobago, 2014). Over 80% of low- and middle-income households cannot afford available housing because of an inflation of housing cost by over 108% (Conrad and Looby, 2017). These households cannot afford a mortgage and therefore some households resort to squatting or rent government housing. Interestingly, the 2011 census for Trinidad and Tobago revealed high home ownership, which may reflect that a very active informal sector is providing a large percentage of housing (McHardy and Donovan, 2016).

In 2008, approximately 750 squatter settlements comprising 600,000 persons or 20% of Jamaica's population lived in squatter settlements (Government of Jamaica, 2014). Over 80% of these settlements were in urban areas. Apart from squatter settlements, approximately 61% of Jamaica's population lives in slums, a pattern that is major concern as social, environmental, economic and health impacts affect these communities as well as the wider community (Tindigarukayo, 2014).

In St. Lucia, over 50% of development has taken place without planning permission, occurs in areas prone to hazards and causes environmental degradation (King-Joseph and Lendor-Gabriel, 2013).



Figure 7: Building on steep sloping lands in St. Lucia leads to hazards such as landslides

Driven by poverty, squatters settle in highly sensitive watersheds and peri-urban areas, especially on steep hillsides and often use poor construction practices and breach building codes (Prevatt et al. 2010). A rapid rate of legal or illegal expansion in the 1970s and 1980s led to significant loss of natural forests under state and private ownership (King-Joseph and Lendor-Gabriel, 2013). Although 80% of the country has slopes greater than 10 degrees, state-owned forest reserves cover only 12% of total land area, leaving most steeply sloping lands unprotected from poor land use practices (See Figure 7). Flooding in Castries is common during the wet season because unplanned human settlements have damaged watersheds in upper valleys and mangroves in coastal areas therefore rendering these invaluable ecosystems incapacitated to protect the densely populated coastal plain. Deforestation impacts were made worse by Hurricane Tomas, which caused heavy siltation of the country's main water source, the Roseau Dam. The cost of repairing damage to the water supply, disposal and works subsector was approximately EC\$124.47 million (US\$46 million) which represented 32% of damage to the infrastructure sector and 14% of the total impact (UNECLAC, 2013).

In the Pacific also, a shortfall in low-cost housing supply, affordable land and available credit has resulted in a rapid increase in informal settlements. In Suva the capital city of Fiji many economically disadvantaged households have gravitated to marginal lands such as mangroves and swamps that are prone to flooding and erosion. As urbanisation pulls rural Solomon Islanders towards the capital, unplanned and self-constructed

settlements continue to expand, outstripping government capacity to respond. Over half the population of the capital city of Honiara live in informal settlements.

For many SIDS, the achievement of SDG 11 is threatened by multiple complex factors. In SIDS, sub-standard housing and a lack of infrastructure to support the well-being of inhabitants are characteristic of unplanned urban settlements. State provision of lifeline infrastructure is often inadequate in these settlements because of their illegal status. In Guyana, Jamaica and Trinidad, thousands of urban squatters are living without lifeline infrastructure such as water, electricity, roads and sewerage facilities (Rajack and Frojmovic, 2016). Settlement upgrading, poor tenure records, haphazard settlement structures and low-quality infrastructure make reconstruction complex and expensive. Five common challenges that impact on informal settlements throughout the Caribbean are weak governance, socio-economic vulnerability and diversity, vulnerability to hazards, weak regulatory capacity and data gaps which limit the capacity to formulate and implement solutions (UN-Habitat, 2020).

In the Pacific SIDS, "political and institutional arrangements are failing to manage the pressures of rapid urban growth ... Key institutions such as municipal councils remain weak, reflecting decades of political neglect and under-resourcing ... While urban plans and policies exist on paper to direct development, in practice the city is being shaped more by powerful interests which operate relatively unfettered by paper regulations" (Barbara and Keen, 2017, p. 16).

The Commonwealth Local Government Forum (CLGF) issued a Call to Action on Sustainable Development and will put this into sharp focus at the Commonwealth Heads of Government Meeting in Kigali, Rwanda in June 2022. CLGF recognises urgent action is needed to manage urban development to ensure that critical sustainable development goals can be achieved. It will highlight that sustainable urbanisation is at the top of its development agenda and forms part of the COVID-19 recovery. SIDS experiences in managing rapid urbanization, ways in which weak urban governance has compromised living conditions of city's dwellers, and a transformative pathway going forward, will form part of dialogue at the CHOGM.

Gender, Climate Change and Sustainable Development

Gender relations are an integral feature of social transformations associated with climate change (Pearse, 2016). Gender analysis is important in a SIDS context because it improves understanding of vulnerability and climate change impacts; adaptations in different contexts; inequalities in climate governance; and knowledge and social action on climate change. In particular, the differential impacts of climate change on women demand that climate actions and strategies reflect gender sensitivity (Alston, 2013). In SIDS, most initiatives that link gender to climate change adaptation, mitigation and disaster risk reduction are embedded in Ministries at the national level. However, local government's understanding of differentiated vulnerability is critical to climate change adaptation and the attainment of SDG 11 especially because policies should be implemented at the local scale for transformational adaptation, resiliency, and sustainable development.

Despite widespread international evidence that the impacts of climate change and disaster events often negatively affect women (and gender minorities) more than men (Aipira et al., 2017; Gaillard et al., 2017; McSherry et al., 2015), attention to gender equality as a concept is still only “embryonic in climate change adaptation in the Pacific” and although recognised in theory (in some policies and project designs), it is not well supported by on-the-ground actions or well monitored (Aipira et al., 2017, p. 237). Many Pacific small island climate change adaptation policies do not mainstream gender across the activities (Aipira et al., 2017), with women's groups being excluded from climate grants due to patriarchal formal and informal governance structures, lack of resources, lower access to educational and training schemes, and no track record (or receiving grants or meeting grant milestones) (Mcleod et al., 2018). However, Pacific women identify several strategies that enable them to adapt to climate change more effectively. These include the recognition and support of women's Indigenous Knowledge and Local Knowledge by governments, researchers, and NGOs; increasing women's access to climate

change funding and support from organisations to allow them to meet the requirements of international climate change grants; and specific education and training to women's groups to allow them to develop strategic action plans, mission statements, learn financial reporting requirements, as well as general leadership and institutional training (Mcleod et al., 2018). Such measures are likely to enable broader representation and participation in adaptation processes despite cultural constraints (Mycoo et al., 2022).

Women in the Caribbean experience similar challenges like their Pacific island counterparts as Table 1 shows.

Studies on SIDS found that among urban dwellers, those most affected by climate change are informal settlement dwellers – a section of the population dominated by women – who are more likely to live within areas vulnerable to natural disasters. In general, women are more vulnerable to the impacts of climate changes due to gender-related challenges in access to opportunities and resources – often due to their exclusion from urban planning, land ownership and management (UN-Habitat, 2015). During natural disasters, female and child fatality rates outweigh those of males. The UN-Habitat, 2015 noted that “this disparity is linked to sociocultural constraints including cultural needs for women to be accompanied by a male family member in public; gender division of labour, which, due to the nature of the work, slows the pace at which women can escape from calamities; physical restrictions on movement as a result of clothing restrictions for women in some places and lack of physical skills useful during climate events such as swimming and tree climbing”. In many SIDS, understanding cultural nuisances throws the spotlight on centuries old patriarchal societies in which women are not key decision-makers or first responders in the aftermath of hurricanes or flooding (Mycoo, 2018c). It is therefore important to consider these aspects of the urban gender divide when discussing the urban dimension of climate change in SIDS.

Table 1: Summary of Gender Issues and climate change in Jamaica

Gender	
Climate Change Variable/Extreme Event	Impacts
Hurricanes, Floods, Tropical Storms	Women's socioeconomic circumstances are worsened during the times of disasters.
	Women comprise half of the population but represent 70% of the population living below the poverty line. This makes them more vulnerable to disasters since they experience higher rates of poverty and unemployment than men. These vulnerabilities are expanded in times of disasters when their risks are increased. This is manifested through higher levels of poverty, extensive responsibilities in caring for others, domestic violence and further fulfilment of duties considered "women's work".
	Gender bias in education. In rural areas in Jamaica, there is a gender bias in the education of girls and boys, as boys are more likely to be removed from school than girls to assist with recovery efforts after disasters and to work on the farm.
	Women and girls who are displaced from home are more vulnerable to sexual violence and sexually transmitted diseases in shelters than their male counterparts. These women face several risks including the outbreak of diseases, especially when shelters are overcrowded, and have inadequate and poor sanitation facilities.
	HIV rates increase among women in times of disasters, especially among those who engage in transactional sex as a survival strategy.
	Human trafficking increases in the event of a disaster disproportionately affecting women and girls. 85% of whom are at risk of being trafficked for sexual exploitation, while 25% of men and boys are trafficked for forced labor.
	Women's mortality increases when disasters occur. Many women sacrifice themselves during disaster when their own traditional caregiving roles hamper their own rescue efforts. This also reflects women's social exclusion because they are less able than men to run, and have behavioral restrictions that limit their mobility in the face of risk especially since their voices often do not carry as much weight as men's in their households. On the other hand, men suffer higher mortality rates because they take more risks trying to save themselves and their families.
	Women and girls are particularly vulnerable in post disaster situations. This is because they lack land and other assets that could help them cope. Therefore, they are more likely to face food shortages, sexual harassment, unwanted pregnancies and vulnerability to diseases and could be forced to drop out of school or marry earlier.
	Rural women's socioeconomic circumstances affect their abilities to respond and recover from disasters.
	As a group, they have lower incomes because job opportunities are more limited in rural areas. Many rural women experience various forms of inequality, related to their gender roles in the household, restricted access to credit to finance micro-businesses and more limited support services.
	Greater loss of income for women in rural areas due to breakdown in road infrastructure.
	Women in rural areas also experience greater income losses than their male counterparts from the breakdown of road infrastructure after the passage of a disaster due to their role in market vending and their dependence on road transportation, which would affect their food and livelihood security (5, p.8).
	Women will experience lower resilience after disasters given weaker socio-economic and lower asset holdings; men are seen as being better able "to come back to their income streams after disaster".

Source: Climate Studies Group, Mona, The University of the West Indies, 2017.

The responsibility to gather household supplies post-disaster is often given to women and often after natural disasters there is a marked increase in women-headed households. For many women and societies this reality is uncharted territory that leads to changes in power hierarchies and gender tensions within societies. The UN-Habitat (2015) highlighted that because cultural histories that do not involve women in decision making before disasters, women may continue to be overlooked in decision making after disasters, despite being household heads and economic providers. Apart from their importance in disaster preparedness and response, more women are needed in climate change adaptation efforts at the scale of the parish or local level where their organisational skills can have the greatest impact at the community level.

A growing body of research is investigating the link between gender-based violence, climate change, disasters, and COVID-19. While there are suggestions that gender-based violence is greater in urban areas, this is not necessarily the case. Studies in Papua New Guinea and Fiji suggest that rates of such violence, while high, are lower in urban than in rural areas (Howe, 2017). However, the effects of climate change may also intensify possibilities for violence, especially in informal settlements where the impacts may be greater. Globally, there is ample evidence that disasters often give rise to increases in conflict including gender-based violence (UN Women Fiji Multi-Country Office, 2018).

A report prepared by the Alliance of Small Island States (AOSIS) on gender responsive climate actions in SIDS concluded that investing in enabling conditions is essential to transition from policies to a gender responsive implementation of climate action. The report highlighted that mainstreaming gender sensitive policy into the broader climate change framework was insufficient to yield benefits. The report found the following, based on the experience of countries which formed part of the analysis (AOSIS, p. 39, 2022):

1. Investing in enabling conditions leads to more effective, efficient, and long-term sustainability of gender responsive climate actions at multiple scales (national, regional, and local);
2. Effective climate governance structures require clear institutional arrangements, strengthened coordination mechanisms, and increased institutional capacities to address gender equality;
3. Countries should consider the strengthening of coordination mechanisms between gender and climate governmental and non-governmental actors and developing institutional capacities at the horizontal and vertical levels on climate change and gender;
4. Inclusive planning requires consultation and participation of key actors that have not always been included in climate change processes. Inclusive and evidence-based planning process

Table 2: Summary Female Representation in Local Government in Jamaica and Trinidad and Tobago (1998-2016)

Jamaica	Year	% Women Councillors	% Mayors
	1998	27	8
	2003	17	7
	2007	18	7
	2012	19	29
	2016	19	0
Trinidad	2003	~27	0
	2008	NA	0
	2010	30	9
	2013	32	0
	2016	30	17

Source: Commonwealth Local Government Handbook 2017/2018

should recognize the gender-differentiated impacts of climate change and the contributions, unique experiences, perspectives and capabilities of women and girls to climate solutions; and

5. Moreover, financial resources for gender mainstreaming need to be allocated at the planning stage.

Some countries are taking steps to address gender inequalities that arise from climate change. Despite significantly higher female educational attainment in Dominica, the structure of decision-making in the society is still male dominated. From a governance point of view, considering the needs at operational, technical and the governance levels derived from the gender analysis, an action plan concerning inclusion of gender issues in Dominica's country programme is being developed over the period 2020 to 2027. Jamaica is implementing the EnGenDER project, funded by the Government of Canada and the UK FCDO, which is facilitating a gender-responsive approach to climate change, adaptation, and mitigation. The project seeks to mainstream

climate and gender considerations in all their policies and programmes, making the approach to disaster risk reduction and development planning more strategic and effective.

It is essential that decisionmakers have an awareness of the integral role women play in service delivery, climate change adaptation and disaster response. Yet, in SIDS women are under-represented in local authorities as shown in the case of Jamaica and Trinidad in Table 1. Women are Mayors in Castries (St. Lucia) and Belmopan (Belize), but they remain a minority in SIDS local government and progress in increasing their representation has been slow. Over a 20-year period, the number of women councillors in Jamaica, one of the larger Caribbean SIDS, has been falling and in Trinidad the numbers are increasing only slightly from 2003 to 2016 (See Table 2). The level of gender equality is far lower in the Pacific SIDS. Regional and local mentorship programmes, aimed at training of women to assume leadership roles in local government bodies, should be developed and implemented by women, for women.

Governance and Climate Change

Governance challenges at the national and local level hamper SIDS efforts to adapt to climate change. Research by Robinson (2018) revealed that 39% of adaptation limits in SIDS are "institutional". Additionally, Robinson (2017) reported poor planning/governance as a barrier to adaptation mainstreaming in SIDS, but this was among several other factors. Of note, however, is the conclusion that Kelman (2016, p. 355) drew that, "all development activities are imbued with power relations [...] among [...] institutions and governance bodies" and, as a result, "SIDS governments should not necessarily be blamed for any deficiencies in national governance due to the challenge of small-scale and limited resources". As some SIDS have "populations in the tens of thousands, it is unrealistic to expect to find a civil

servant conversant in every aspect of CCA [climate change adaptation]; hence, the need for pooled governance as part of inter-SIDS cooperation" (Kelman, 2016, p. 355). But as Robinson and Gilfillan (2017) found, pooled adaptation governance at the regional level in the Caribbean and Pacific is hampered by competing organizational mandates and major climate information deficits. "It, therefore, remains difficult to identify effective solutions to governing climate change at finer scales, and to quantify the relative impact of poor governance quality on island vulnerability and adaptive capacity, though some scholars would argue that poor governance in many SIDS is a development challenge in which climate change compounds and undermines existing resource constraints" (Robinson, 2020).

Role of Local Government

Researchers have highlighted several barriers that affect local government performance. Local level plans are often overlooked as is the case for example, in Mauritius, where local level climate adaptation plans are currently nearly non-existent and district councils have rarely been successful in accessing international adaptation finance (Williams et al., 2018). In Samoa, several national level programmes on adaptation have encountered difficulties in engaging with the local level even if the decision-making powers on actual land management reside within the communities (McGinn and Solofa, 2020). In the Caribbean, the lack of strong urban governance mechanisms to enforce building regulations has contributed to buildings which violate site development standards, urban sprawl, and burgeoning informal settlements, which all pose a challenge to climate change adaptation. (Enriquez-de-Salamanca, 2018; Mycoo, 2018a; Mycoo 2018b).

Legislation has been enacted that requires local government in SIDS to perform several key functions which are instrumental in helping small islands adapt to the challenges of climate change as well as enhancing the potential for SIDS to attain SDGs. These functions are discussed using examples drawn from Jamaica, Trinidad, and Fiji. From these selected case studies, it is apparent that not all local governments are involved in preparing spatial and economic plans for their parishes. The devolution of such responsibilities would, however, allow them to play a major role in achieving the SDGs.

Jamaica

Local government is responsible for local planning and strategic direction including: local sustainable development planning and development control; municipal enforcement and regulation of health, commercial services and civic order; and parish infrastructure. It also shares responsibility with central government for a range of services including water supply, environmental health, and local economic development. Legislative provisions have been made through the Local Governance Act 2016, mandating local government to formulate sustainable urban policies and configure a governance framework that supports urban

renewal, sustainable livelihoods, and high-quality living standards in urban centres.

Specific responsibilities of Kingston and St. Andrew Corporation and Parish Councils:

- Developing, managing, and maintaining infrastructure and public facilities such as parochial roads, water supplies, drains and gullies, parks, recreational centres, markets, abattoirs, pounds, cemeteries, transportation centres, public sanitary conveniences and public beaches.
- Provision of local services such as poor relief, cleaning of public spaces, public health, and street lighting.
- Regulatory powers in respect to building and planning approvals and development control, licensing of trades and businesses, street parking, control of public vending.
- Coordinating inter-agency collaboration among non-governmental organizations (NGOs), community-based organizations (CBOs) and government agencies which operate in the parish and are engaged in the delivery of local services or in local development.
- Support of national policies/development programmes at the local level.
- Spearhead plans and initiatives for the orderly, balanced, and sustainable development of the parish as a whole, and major towns in particular, and for the boosting economic activity and local wealth creation within the parish.

At the local level, Jamaica has developed in some municipalities, disaster plans and evacuation plans with an early warning component. Further, in accordance with the newly revised Disaster Risk Management Act, parish disaster committees and zonal committees have been established to provide relief to local communities.¹

¹ Local Government disaster risk planning in Jamaica, including evacuation plans and Parish Disaster Committees (Source: Deputy Mayor Richard Vernon, St. James Municipal Corporation, (Jamaica) - Caribbean Development Bank and Commonwealth Forum for Local Government Regional Conference, Barbados, *Building back better: local government delivering development in the Caribbean*, May 2022).

All these functions contribute to the attainment of the SDGs. For example, local sustainable development plans prepared by local authorities reflect issues such as natural disaster management, environmental conservation and management, designation of protected areas to safeguard Jamaica's biodiversity, land management and poverty alleviation. Activities related to local sustainable development planning address issues such as climate change, risk reduction, local economic development, employment, and environmental conservation using a participatory approach which draws on the synergies of the public and private sectors, non-governmental organisations and community-based organisations.

Trinidad

Local government in Trinidad has responsibilities which include:

- Policing;
- Monitoring of nurseries and childcare; homes for the elderly;
- Management of bus and taxi shelters;
- Maintenance and management of street markets, slaughterhouses and common and recreation grounds;
- Solid waste removal and management; and
- Management of corporation cemeteries and crematoria.
- Enforcement of building and land development regulations (town planning regulations, e.g. ensuring the use of hurricane straps, setback distances, site and building coverage);
- Drainage and flood emergency response;
- Streets, roads, bridges and culverts maintenance;
- Management and improvement of physical environments through tree cutting, parks, playfield and open space maintenance and the clearance of landscapes;
- Enforcing regulations for promotion of public health and sanitation; and
- Public education on disaster risk reduction.

The National Spatial Development Strategy and Spatial Development Plans prepared for each

municipality a decade ago are used by local authorities to guide development occurring within the municipalities' boundaries. However, the slow roll out in assigning land use planners to each local authority has limited the use of these plans.

Fiji

The powers and duties of councils are set out in the Local Government Act 1972, Section 88 (1). The Act mandates a council to 'do all such things as it lawfully may and as it considers expedient to promote the health, welfare and convenience of the inhabitants of the municipality'. Specific functions elaborated in the Act include the establishment and maintenance of public utility services, including public transportation and public works; public health; markets; recreation facilities; refuse collection; town planning; environmental management; town beautification; libraries; car parking; and the construction and maintenance of drainage. Councils may exercise all or any of the functions set out in the Act. It is common for councils to contract some services out to the private sector – for example waste removal, street cleaning, and maintenance activities.

Innovation in Local Government

Some SIDS have embarked upon innovative programmes and practices designed to streamline their operations to better service local communities and in keeping with the ethos of 'leaving no one behind'. Examples are discussed in this section.

Dominica²

Dominica is adopting an innovative approach to capacity and resiliency building at the local community level which it is seeking to have fully implemented by 2030. Framed within the context of the Climate Resilience and Recovery Plan (CRRP), it embarked on building resiliency at the community level by first conducting vulnerability assessments of local communities. Three aspects of vulnerability were considered and ranked. Physical vulnerability of communities was ranked as number 1 and related to the impact of climate change on communities, livelihoods, shelters, and the adequacy of the equipment used in shelters. Social vulnerability ranked number 2 and highlighted the vulnerability of specific demographic groups which included single parent households, persons aged 70 and over (elderly), children under 13 years of age and physically challenged persons. Organisational vulnerability was ranked number 3 and related to local government existence, relevance, and the capacity of disaster planning committees. The vulnerability assessments for communities revealed that 14 communities were most vulnerable, 28 more vulnerable, 11 less vulnerable and 14 the least vulnerable.

Under the Community Emergency Readiness Initiative (CERI) it was recommended that local governments and community-based organisations in 37 communities required capacity building. Based on the experience of Hurricane Maria, some communities were cut off from central emergency responders, and unable to cope with their most basic needs, resulting in physical and mental stress. CERI therefore aims to enhance community capacity to be self-sufficient for 15 days after a major climatic event. This initiative will specifically develop Community Disaster Management Committees, Disaster Management Plans for all communities and provide equipment, food, water, and backup power

generators to allow 15 days' autonomy among communities and less dependence on Central Government during a disaster (See Table 3).

Ecosystem based adaptation (EbA) will be implemented in the most vulnerable communities to build capacity to adapt to climate change. An EbA project was developed for the community of Petite Soufriere, which is vulnerable to climate shocks, land slippage and depends heavily on coastal marine and upland ecosystems for its livelihood. The Project "Strengthening Coastal and Marine resilience through upland and Ecosystem based Adaptation and Community Engagement" will seek to build the adaptive capacity of the community using sustainable green engineering solutions to climate change, as for example the planting of vetiver which is an effective in slope stabilization measure. The planted material will also be used to develop sustainable livelihoods by using the grass for craftwork and producing products such as baskets and mats.

A third initiative being promoted in Dominica is one which focuses on fostering urban resilience through urban risk management consistent with SDG 11 and the generation of local economic opportunities to reduce poverty. To promote urban risk management, a Centre of Excellence for Data in Resilience Decision-making will establish a dedicated geographical information systems (GIS) unit within the Ministry of Economic Affairs, Planning, Resilience, Sustainable Development, Telecommunications and Broadcasting, centralize the gathering of data (GIS and beyond), and institutionalize a data-driven approach to all key planning decisions. This unit will be critical to the finalization and implementation of the Resilient Dominica Physical Plan, including activities related to land management, hazard mapping, and infrastructure planning.

2 Dominica: National climate resilience policy and its implementation to date (Source: Glenroy Toussaint, Commissioner of Local Government (Dominica) - Caribbean Development Bank and Commonwealth Forum for Local Government Regional Conference, Barbados, *Building back better: local government delivering development in the Caribbean*, May 2022).

Table 3: Summary of Initiatives for Building Community Resilience in Dominica

Strong Communities				
Goal	2030 Target	Immediate Outcomes (2025)	Output milestones (2021/22)	Initiatives
Reduce the humanitarian impact of disasters	Zero climate-event related facilities	<ul style="list-style-type: none"> Community health service functional within 1-2 hours of a major event 80% by 2025 and 100% by 2030 Reduced number of schools used as LT shelter <10% by 2025 and < 5% by 2030 	<ul style="list-style-type: none"> Updated national curriculum with DRR and civics: delivered to 20,000 children by 2022 Advocacy and public awareness plan Train teachers in DRR and emergency readiness on resilience by 2021 	<ul style="list-style-type: none"> Community Emergency Readiness Initiative: Building communities that are equipped mentally and physically for disasters and extreme weather events Modern Village Council Initiative: Building capacity at the community level in order to form a community management structure to build resilience
	Communities able to operate safely and independently for 15 days	<ul style="list-style-type: none"> Vulnerable people receiving social protection post disaster -100% by 2025 Community Disaster Committees with a communicated DMP and all resources ahead of hurricane season- 50% by 2025 and 100% by 2030 	<ul style="list-style-type: none"> Shelters covered under National Shelter Plan Community Food Stores Initiatives: ensuring communities have access to a food bank ahead of hurricane season Responsible Land Stewardship Initiative: Resilient Land Use Programme at the community level 	
Improve capacity of communities to recover quickly	Individuals able to revert to basic living standards within 4 days	<ul style="list-style-type: none"> Emergency shelters well equipped and food and water supply for 15 days in place- 50% by 2025 and 100% by 2030 	<ul style="list-style-type: none"> Assessment of 50% housing compliance with building regulations complete by 2021 	<ul style="list-style-type: none"> Enhanced Social Safety Net Initiative: A Welfare System that works for the most vulnerable: will build base resilience Each One Reach One: Youth Resilience Initiative building day to day resilience and capacity 100% Smart Health Centers Initiative 100% Smart Schools Initiative
	90% of housing built or retrofitted to resilient building codes	<ul style="list-style-type: none"> Functioning and effective village councils 50% by 2025 and 100% by 2030 		
Reduce the vulnerability and exposure of people and property to future shocks	100% resettlement of individuals living in physically vulnerable locations	<ul style="list-style-type: none"> > 60% of houses comply with building regulations 		<ul style="list-style-type: none"> Resilient Housing Initiative: Transform the structure reliability of the nations housing to extreme weather Development and implementation of Resilient Dominica Physical Plan

Jamaica

Jamaica has embraced new technology to enhance citizen engagement at the community level. In the planning arena, local government is implementing software (known as AMANDA) which enables development and building applications submitted by clients and citizens to be reviewed and tracked online. The overall objective in using Information Communication Technology (ICT) is to improve efficiency of operations, as well as transparency and accountability in the development application process. Clients can track applications submitted to the Municipal Corporations and view their status and milestones within the application process. Service delivery is being further improved using GIS/ spatial data and maps of the different jurisdictions or localities. Access to these allows clients to plan their developments more effectively. More generally, local service delivery is being improved with the utilisation of national government standard 'gov. jm' email addresses. Some Municipal Corporations have issued elected officials with computer tablets, to ensure they have ready access to information wherever they are. Email is also used to circulate correspondence and minutes of meetings to elected officials, which promotes effective planning and prompt decision-making.

In 2012, the Government of Jamaica prepared an 'E-Powering Jamaica' master plan and elements of that plan are included in the ICT strategic plan of the Ministry of Local Government and Community Development. A programme has been established to install computerised financial management and accounting information systems within councils and continues to be fine-tuned to modernize accounting practices consistent with national and international accounting standards, as well as to improve efficiency and effectiveness in the execution of accounting functions.

The websites of all 14 Municipal Corporations are used to disseminate information to the electorate/ citizens, and each municipality publishes its activities, projects, plans and decisions on its website to improve the transparency of its operations. Additionally, most Municipal Corporations broadcast their public council meetings monthly on local cable TV stations to further engage their constituents and citizens. A few have live-streamed these meetings online.

Another medium of engagement is extensive use of social media platforms to connect with constituents, promote activities and disseminate information to improve citizen engagement at the local level.

Trinidad

Trinidad local authorities are exploring the possibility of improving transparency in their operations and community participation through information dissemination using E-platforms. A complaints management software system (CMSS) is being commissioned for use by all municipalities to receive and log complaints, which will also be used to give citizens the opportunity to share ideas for community development and obtain real-time information on issues affecting their communities. Video conferencing is also being promoted to enhance stakeholder participation in discussing issues, ideas and solutions for improving the quality of service delivery within local areas.

The way forward: Local Government, Climate Resilient Development Pathways and Sustainable Development

Local government resource mobilisation is an important factor in realising climate resilient development in urban areas. There is a clear role for local governments to work closely with the informal private sector to achieve climate change adaptation, economic development, and disaster risk reduction. But many cities and local governments in the Pacific region are severely resource constrained (Kiddle et al., 2017; Kelman, 2014). Pacific local governance literature highlights the gap between commitment and practise, and regional responsibility for urbanisation remains unclear (Kiddle et al., 2017; Keen and Connell, 2019; Trundle, 2019). Some Caribbean islands are integrating 'building back better' using disaster resilient building techniques and codes complemented by robust land use planning policy in the post-disaster period (Twigg et al., 2017). However, more effort and resources are needed in implementing this approach throughout the Caribbean (Wilkinson and Twigg, 2018).

Enforcement of building and land development regulations

To effectively play a role in climate change adaptation and resiliency building, local governments will require capacity building, a strong commitment to encourage citizen compliance with regulations, while simultaneously becoming positive change agents in plan and project implementation and monitoring. For example, building inspectors who are responsible for issuing building completion certificates must ensure that approved site and building coverage standards as well as setback distances approved by the town planning departments are adhered to by large developers or households when constructing buildings. Where developers or individual homeowners violate site and building coverage regulations thereby increasing the level of concretised surface, if there is no enforcement of such site development standards, flooding will become more severe in the face of climate change. If structures are built without regard for the approved side setback distances for buildings which are designed to improve air circulation and cross ventilation,

occupants will experience heat stress and may invest in air conditioners for cooling the building which contributes to higher greenhouse gas emissions and consequently global warming. Additionally, with strong winds accompanying tropical cyclones and storms, it is imperative that building inspectors ensure that hurricane straps are used to secure roofs. With SIDS cities increasingly experiencing climate change impacts, local government requires strong enforcement capacity, partly strengthened by having enough building inspectors to conduct site inspections in a timely manner during construction, and in the 'build back better' phase after tropical cyclones and storms have occurred.

Infrastructure Maintenance

Local government's role in infrastructure building and maintenance is integral to climate change resiliency building and fundamental to attaining sustainable urbanisation in Commonwealth SIDS. Local authorities' failure to ensure routine culvert and drainage maintenance and efficient solid waste management will exacerbate flood impacts associated with climate change as well as compromise human health, which is expected to become increasingly vulnerable due to the proliferation of vector borne diseases such as dengue etc. Flooding will also cause major water supply sources to become contaminated causing a temporary closing of reservoirs and dams thereby limiting potable water supply and resorting to water rationing. Interruptions in household water supply can be less frequent if drains and culverts are routinely cleared.

Infrastructure maintenance such as road and bridge maintenance and solid waste management are essential to ensure efficient disaster response by local government. The lack of systematically rehabilitating roads and bridges leads to delayed responses if roads and bridges are flooded, thereby leaving communities without the necessary relief they require in times of emergency.

Tree cutting, landscaping, park and playground maintenance are essential to ensuring human

health. In coping with growing urban heat stress which is being experienced due to hotter days occurring in SIDS cities, the cooling effects of trees, including the shade and clean air they provide, must be considered in tree pruning and landscaping. This is an area for capacity building through training in tree pruning and selection of low maintenance trees bringing the science of landscape architecture to inform urban greening initiatives. Local government should consider forming viable partnerships with the business sector and local communities to sponsor trees for greening of urban areas and to assist ongoing maintenance where possible. Resource mobilisation in this way can help supplement budgetary constraints.

In many Commonwealth SIDS, raising public awareness through education campaigns can help resource-constrained local governments perform their duties more effectively. For example, communicating to local communities that poor solid waste disposal practices contribute significantly to the malfunctioning of drains and culverts could minimize flooding of roads and bridges if individuals desist from such practices. In this way, local governments can reallocate fiscal and human resources to more urgent disaster risk reduction programmes and projects.

Ecosystem-based adaptation and community participation

Although at the city-level hard engineering measures such as sea wall construction have been used as coastal defences to protect population, infrastructure, and economic assets in the low-lying coastal plains of SIDS, ecosystem-based adaptation (EbA) is increasingly popular as a climate change adaptation response. In the Caribbean, EbA approaches are somewhat absent in national and regional programmes and plans, yet at the local scale EbA strategies are used increasingly with implementation mostly led by NGOs (Mercer et al., 2012).

EbA measures cost less to implement and maintain in contrast to structural armouring and they enhance community engagement. Examples of EbA responses to climate change in SIDS are mangrove replanting in coastal areas and re-forestation in higher elevations to facilitate watershed management and reduce inland flooding. Incorporation of forests is increasing, in most cases as components of ridge to reef (or

Disaster Risk Reduction) projects, and is geared towards integrated watershed management to establish downstream water security, erosion control and ultimately to protect the health of coral reef ecosystems (Förster et al., 2019). EbAs can easily be implemented by local governments in SIDS once they have the requisite help from environmental experts working at the ground level with communities. In some cases, local authorities may have overlapping jurisdiction over watersheds and floodplains which requires inter-agency collaboration in resolving transboundary issues such as integrated watershed management and flooding.

Community-based adaptation (CBA) is best described as a 'community-led process based on meaningful engagement and proactive involvement of local individuals and organisations' (Remling and Veitayaki, 2016; p. 380). Community-based projects demonstrate in the Pacific that communities' vulnerabilities, priorities and needs might be a better and more effective entry point for climate adaptation than framing projects solely around climate change (Remling and Veitayaki, 2016; Weir, 2020). This is supported by a recent review of 32 CBA initiatives in the Pacific where initiatives that were locally funded and implemented were more successful than those with external international funding (McNamara et al., 2020). Initiatives that integrated EbA and climate awareness raising also performed better.

Fiscal resources and decision-making autonomy

Caribbean urban authorities often lack fiscal independence to implement projects that are central to improving the quality of life of urban residents. Oftentimes, taxes collected from municipal governments, including property taxes, are transferred to central government funds. Urban development corporations and local planning authorities require fiscal autonomy to undertake mid and long-term planning targeted at fulfilling strategic goals of improved access to a better quality of urban services.

An effective climate strategy implies increasing urban resilience through more than a mere control of land use change, addressing the infrastructure needs and the way in which land should be used, in terms of resource consumption and flows (IADB, 2015). It requires updated data on the demand for urban services and the means to implement

changes that often imply a cost to the public administrations. Local governments will require more fiscal resources to perform their roles and responsibilities and these allocations will involve a dependence on transfer and subventions from central government which tends to reduce its decision-making autonomy. To achieve some amount of financial independence local governments will need to mobilise its own funds from local tax collection, for e.g. property tax, as well as by seeking grant funding from international donors and multi-lateral development agencies.

Accessing the Green Climate Fund

Several barriers to accessing capital have been identified by local governments in Commonwealth SIDS including fiscal and/or technical capacity limitations, and challenges from project preparation to accessing finance and implementation. Due to the limited financial sources and level of autonomy of action, pre-financing or co-financing is not yet affordable. Additionally, when finance is available, local governments often lack information on these various financing opportunities and project preparation facilities at hand. The current financial architecture is complex and not easy to navigate, nor is it easy to identify the right financial model. The Caribbean Community Climate Change Centre (5Cs) is working with local governments to strengthen their capacity to access climate change funding via the Green Climate Fund. The 5Cs is assisting Caribbean SIDs to understand the climate finance architecture. The main sources of public green finance include multi and bi-lateral development banks, UN climate funds, national and regional banks, and European Union Funds. In May 2022, the UN dedicated through the Global Environmental Facility climate change adaptation funding solely for SIDS. It is the first multilateral Special Climate Change Fund under the UNFCCC.

No single source of finance will be sufficient to cover the rising costs local authorities will face in securing climate change adaptation and sustainable development. A mix of loans, grants, bonds, micro-finance, tax revenue, community lending and crowdsourcing is recommended. The sale of local government owned land and assets has emerged as a potential source of finance, but some caveats apply. For instance, land resources are limited and are a one-time income flow. As a

rule, asset sales of this kind have been viewed as a temporary financing expedient and fiscal experts have warned cities not to become dependent upon asset sales as a significant or continuing source of capital financing.

Human resource capacity building

Local governments in the Commonwealth SIDS have been staffed with engineers, building inspectors, accountants, but there remains a skills gap in urban planning, landscape architecture, geoinformatics engineering, public education, and communication. To reduce the disconnect occurring in land use zoning, informal urbanism, the enforcement of site and building regulations, environmental management, infrastructural development and maintenance, urban greening and city design, siloed approaches should be replaced by an integrated planning and management approach. A holistic approach calls for human resource capacity building within local government. A team of specialists comprising land use planners, engineers, landscape architects, geoinformatics engineers, economists, accountants, building inspectors, disaster response managers, communications experts and personnel with experience working with communities, would provide an interdisciplinary approach to urban governance. Local governments can also benefit from international donor agencies which provide staff training opportunities aimed at closing skills deficits. Specific skills in proposal writing to obtain grant funding should be developed among staff.

Technological Capacity Building and Tools

Local authorities in Commonwealth SIDS have limited technological capacity to conduct their main activities. For instance, they have few drones to do quick reconnaissance surveys during and after a natural hazard such as a tropical cyclone, flooding, and landslides. Such technology is hardly used to identify the location of fallen trees, broken bridges or damaged road and electrical infrastructure. Unmanned Aerial Vehicles should form part of the tools made available to local government offices to maximise efficiency and minimise risk.

Limited use of geographic information systems (GIS) is an obstacle to road and drainage maintenance. Using a spatial infrastructure database, the mapping of roads, drains, culverts,

and bridges within each local government's jurisdiction, provides a decision-making tool to keep track of when maintenance should be scheduled before and during the tropical cyclone season in preparation for hazard responses. Such a tool also improves local governments' capacity to prioritise fiscal resource allocation based on a needs assessment that determines when and where such resources should be targeted.

Digital maps remain unavailable to citizens which limits meaningful participation in urban planning and access to open source data remains a challenge as agencies have not worked out the data sharing protocols. Digitalization of administrative service and smart applications for the provision of public services are key to improved urban governance. ICT implementation, along with effective transparency methods, provide better management quality, and enhance citizen participation in urban planning and management. Technology can also provide a consistent framework to improve the delivery of municipal services, integrating a vision of a Smart City that combines transparency, good management, participation and sustainable infrastructures and services (IADB, 2015). This vision creates a virtuous circle that seeks to ensure a better environment for investment and therefore allows potential opportunities for public-private partnerships.

The advent of a miniaturization of technologies and the proliferation of new mobile sensor platforms and lower cost sensors can result in dramatic increases in data collection and quality, and the ability to tailor sensors to specific data collection needs. Among the new apps that may be adopted by planning agencies in the Region is one that allows residents to alert planning agencies of city issues and to upload complaints to local government via their smartphone, which can ultimately enhance enforcement capacity.

High-resolution satellite data offers many possibilities to perform urban planning functions. Satellite remote sensing is a powerful tool for timely and cost-effective development of information in a wide number of applications. GIS technology, smart maps, Google Earth, and drones can be put to effective use in spatial analysis, synthesis, and visualization not only in spatial planning, but transportation planning, natural hazard risk

management, and building climate change resilience. Additionally, more urban planners should employ 3D modelling because it allows them to test various scenarios and expedite the urban planning process. It is not only cost effective but provides more accurate data for evaluation and decision-making. Participatory mapping can also facilitate community engagement in environmental risk assessment, vulnerability assessments, and climate change adaptation. Landsat data, now freely available on the Internet and cloud mapping, also hold tremendous potential to improve spatial planning and environmental management in Caribbean countries.

Building partnerships

SDG 17 addressed the importance of building partnerships to achieve the 17 SDGs. Building partnerships among central government agencies, other local authorities, the private sector, communities and professionals in practice and academia can reap benefits related to climate change adaptation and sustainable urbanisation as each actor in the intuitional landscape has different core competencies. The modalities for engaging partners will need to be clearly articulated in institutional policy and administrative arrangements.

The Commonwealth Local Government Forum has been launching networks to foster partnerships and encourage synergies to 'build back better' and sustainably. The Commonwealth Sustainable Cities Network (CSCN) is playing an active role in bringing together Commonwealth mayors and managers to support the growing challenge of making cities and human settlements more sustainable. Through the CSCN, its membership can share experiences in developing and implementing a New Urban Agenda and achieving SDG 11. CSCN provides opportunities for SIDS to build city to city partnerships, shared learning, develop targeted programmes, and strengthen city governance and leadership. Moreover, youth involvement has become a focus of the CSCN as it seeks to develop youth leaders to work in their communities to improve city life and living conditions for a sustainable urban future. Youth make up 60% of the Commonwealth's population which is under 30 years old, and is consistent with demographic trends in SIDS. In March 2022,

the new Commonwealth Youth for Sustainable Urbanisation Network was launched, which is expected to provide a forum for the exchange of innovative ideas in tackling one of the biggest challenges facing the young generation and to develop valuable inter-generational dialogue.

The recently hosted regional conference for Caribbean SIDS local governments held in Barbados presented an opportunity for an exchange of experiences in carrying out their mandates. A common issue raised was that of limited, if any, access to funding for climate change adaptation and meeting the SDGs. Most funding for such projects is channelled to central government. International networks such as the Commonwealth Local Government Forum can provide support to SIDS local authorities in:

- Identifying funding sources aimed at building capacity to co-design projects with local communities and strengthening programme implementation, monitoring and evaluation, revenue collection, acquisition of technology for data collection, analysis, problem solving and use of decision-making tools;
- Knowledge sharing on the importance of the SDGs and ways of tracking their performance by using SIDS relevant indicators. The CLGF knowledge hub can play an instrumental role in this regard;
- Developing digital knowledge sharing platforms to enhance knowledge transfer which can cut costs when compared with face-to-face meetings;
- Developing training material and hosting workshops to build human resource capacity to mainstream SDGs in practice. Such workshops allows for the sharing of good practice and models of sustainable urbanisation and integration of the climate change agenda, practices, policies, strategies, programmes, multilevel governance, partnerships etc.

As an example, DALCA is currently pursuing a pilot project funded by the European Union through the Commonwealth Local Government Forum. DALCA, in collaboration with the Local Government Division is piloting implementation of the SDGs in selected councils.

CLGF is also working to close the gap in gender equality through the establishment of the Commonwealth Women in Local Government Network (ComWLG). Specific action areas it is promoting include building capacity among elected women to overcome barriers to their engagement, to take on leadership roles and to become effective decision-makers. It is also championing efforts to engage young women to run for council and to bring a fresh perspective to local authorities to reflect gender sensitive policies in their operations and projects. CLGF is also collaborating with international networks to collate and share best practices on gender inclusion to replicate successes in other countries where women have so far been marginalise.

COVID-19

The pandemic has also been framed as an opportunity to ‘reset’ entrenched systems, a catalyst for difficult change (e.g. Everingham and Chassagne, 2020; Hawkes, 2020; McNeely, 2021). Climate policy discourse has numerous frameworks which can and are being drawn upon in the emerging literature on green recovery from the pandemic. Concepts such as adaptive development (Eakin et al., 2014), climate-resilient development (Fankhauser, Schmidt-Traub 2011), development-based views of climate change adaptation (Ayers, Huq 2009: 683), and more recently climate-resilient development pathways (Schipper et al., 2020), and planetary health approaches (Fears et al. 2020), are being used as frameworks to promote post-pandemic recovery. All these approaches have in common the inclusion of development needs, the empowerment of communities, and an overall holistic approach that explicitly promote a more sustainable and resilient future (Foley et al., 2022). In SIDS, green recovery may also be expected to favour nature-based solutions to the challenges of sustainable development post-pandemic, especially ecosystem-based adaptation (EbA) which has been increasingly recognized as an effective approach in many Pacific SIDS (Duvat and Magnan, 2019).

Yet because SIDS are experiencing and responding to the pandemic in different ways, different options for ‘climate resilient recovery’ may also have context-specific impacts. COVID-19 has also had adverse impacts on the capacity of many SIDS to take forward climate action, diverting funds to sustain socio-economic supporting measures (Thomas and Theokritoff, 2021), while some SIDS were able to create financial buffers to be used in such crises (Cooke et al., 2021). To ensure ‘green’ recoveries are also socially just recoveries, it is critical that we understand who will gain the economic, social, or environmental benefits, and who might lose out (Foley et al., 2022).

The growing literature on the COVID-19 recovery emphasises the need to ‘build back better’ (e.g. Agrawala et al., 2020; Klassen and Murphy, 2020), suggesting the possibility of reducing vulnerabilities. But experience of rebuilding and

recovering from geophysical disasters suggests that often, post-disaster redevelopment further marginalises the vulnerable by failing to engage with local understandings, priorities, and capacities (e.g. Rhiney, 2020; Su and Le Dé, 2020). As with any climate policy, it will be essential to place equity at the heart of decision-making (Pelling and Garschagen, 2019) to ensure that actions address the needs of the poorest and most vulnerable. The role of local government is critical in COVID-19 recovery especially in two areas: greening cities and other open spaces to meet recreational needs which are important to mental and physical health and ‘building back better’ post natural disasters by ensuring compliance with building codes and other site development regulations to minimise loss and damage and expenditure which should be prioritised to achieve other sustainable development goals.

The pandemic accelerated the digitalisation of many aspects of service delivery which can now be used to capture broader stakeholder participation at the local government level. Previously attendance levels at public consultations on local plans and projects were quite low due to the times they were held. Few women participated in these meetings because of domestic responsibilities. Pivoting to online platforms such as Zoom and other teleconferencing media provides ample opportunity for community voices, including those of women and youth, to be heard.

Conclusion

This paper drew on local government experiences from small states across the Commonwealth, highlighting constraints, good practices, innovations, and opportunities to 'build back better' in the context of climate change, urbanisation, equity, a green COVID-19 recovery and sustainable development. Despite the challenges faced by SIDS, overcoming them will require support locally, regionally, and internationally through partnerships. Accelerated action is critical to sustainable development and key requirements to attain this will include building human resource capacity drawing on the synergies of an interdisciplinary cadre of professionals, the business sector, academia and non-governmental bodies, including community-based organisations and faith-based organisations; improved access to finance and technological resources; and the political will to engage communities through local governments because of their closer interaction with citizens. In partnering with local communities and empowering them with resources to make decisions, successful project implementation and sustainability are likely to be significantly enhanced.

Small islands are highly vulnerable to climate change impacts and suffer tremendous loss and damage that are projected to increase in the future. COVID-19 brought tremendous economic shock to SIDS derailing efforts to attain the UN SDGs and weakening their resiliency. It has been described as 'code red' if the global community fails to make a strong and urgent commitment to reduce greenhouse gas emissions to tackle climate change. COVID-19 presented opportunities to embrace digitalisation which is proving to be a good practice to stimulate the use of ICT to enhance democratic accountability. But central governments cannot achieve any of the SDGs and recovery from climate change disasters by going it alone; a siloed approach has proven to be ineffective. National governments will need to build alliances with local governments that are closer to the reality on the ground and better understand the strengths and constraints that characterise communities. Forging partnerships among central and local governments

and international networks is paramount to scaling-up action as SIDS experiences have confirmed. At no other time the slogan 'Think globally, act locally' has been more relevant to transformative adaptation, resiliency, and a sustainable trajectory.

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