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PERSPECTIVE

Small Island Developing States in a post-pandemic world: Challenges and opportunities for climate action

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Abstract

Small Island Developing States (SIDS) have been impacted by and responded to COVID-19 in ways that give us clues about vulnerabilities under climate change, as well as pathways to resilience. Here, we reflect on some of these experiences drawing on case study examples from the Caribbean, Pacific, and Indian Ocean SIDS, exploring how SIDS have responded to COVID-19 and considering the potential for coping mechanisms enacted for the pandemic to support long-term resilience to climate change. Island responses to the pandemic highlight both new directions, like tourist schemes that capitalize on the rise of remote working in Barbados and Mauritius, and reliance on tried and tested coping mechanisms, like bartering in Fiji. Some of the actions undertaken to respond to the pressures of the pandemic, such as visa schemes promoting “digital nomadism” and efforts to grow domestic food production, have climate resilience and equity dimensions that must be unpacked if their potential to contribute to more sustainable island futures is to be realized. Importantly, the diversity of contexts and experiences described here illustrates that there is no single “best” pathway to climate-resilient post-pandemic futures for SIDS. While the emerging rhetoric of COVID-19 recovery often speaks of “roadmaps,” we argue that the journey towards a climate-resilient COVID-19 recovery for SIDS is likely to involve detours, as solutions emerge through innovation and experiment, and knowledge-sharing across the wider SIDS community.

This article is categorized under:

Climate and Development > Sustainability and Human Well-Being
Integrated Assessment of Climate Change > Assessing Climate Change in the Context of Other Issues

KEYWORDS

climate resilience, COVID-19, food security, Small Island Developing States, tourism

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1 | INTRODUCTION

Small Island Developing States (SIDS) are widely acknowledged as especially climate-sensitive, disproportionately affected by the physical impacts of climate change, and faced with context-specific economic, social, and political challenges in their efforts to adapt (Robinson, 2020). SIDS are a heterogeneous group which defy easy definition. Not all members of the grouping are necessarily “small” or “islands” (some are coastal nations) or “developing” (based on their economic data) or even “states” (some are territories) (Kelman & West, 2009; Nel et al., 2021). Yet the shared characteristics of SIDS are sufficient for the United Nations to recognize this a special group (Thomas et al., 2020). As well as climate change, many SIDS were already navigating a range of sustainability challenges prior to the COVID-19 pandemic; for example, food security amidst a reliance on imports (Cheng et al., 2021; Connell et al., 2020), and growing the tourism sector while mitigating its negative environmental and social impacts (Tyllianakis et al., 2019).

The experience of the pandemic in SIDS has been diverse (Figure 1). Sea borders can be an advantage for containing COVID-19 (Nanau, 2020), but with sea boundedness comes a dependency on connection for many islands. Caribbean countries handled the initial outbreak well (Murphy et al., 2020), with prior experience of stay-at-home orders during tropical cyclones facilitating acceptance of these measures to control the spread of COVID-19 (Hambleton et al., 2020). But as restrictions on travel were eased in response to the pressures of lockdown on tourism-reliant economies, case numbers rose on many Caribbean islands (Telesford, 2021). A similar situation occurred in the Pacific Islands where prompt border closures reduced infection numbers (Leal Filho et al., 2020). As of June 2021, some countries like Tuvalu are still recording no COVID-19 cases (see below), but in others, post-closure repatriation of overseas nationals combined with inadequate internal management appears responsible for current outbreaks (Sachs, 2021). For many SIDS, health, economic, and social impacts have combined, resulting in compounding shocks, and often amplifying pre-existing sustainability challenges. A diverse array of coping strategies has been deployed to manage these shocks. As with climate adaptation strategies, some of these actions are “soft” and reversible, while others are “hard,” altering lives and livelihoods in ways that will be more difficult to undo. For example, Blazy et al. (2021) found that some farmers in the Caribbean have responded to income losses during the pandemic through diversifying production and targeting this to local markets, while others have been forced to sell livestock and even land. Bartering in the absence of cash wage-earning has become commonplace in many Pacific Island Countries (various, personal communications to PN) and elsewhere (Gunia & Lewicki, 2020).

The pandemic has also been framed as an opportunity to “reset” entrenched systems, a catalyst for difficult change (Everingham & 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, p. 683), and more recently climate-resilient development pathways (Schipper et al., 2021), 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 promotes a more sustainable and resilient future. In SIDS, green recovery may also be expected to favor nature-based solutions to the challenges of sustainable development post-pandemic, especially ecosystem-based adaptation which has been increasingly recognized as an effective approach in many Pacific SIDS (Duvat & Magnan, 2019).

Yet because the 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 & Theokritoff, 2021), while some SIDS were able to create financial buffers to be used in such crises (Cooke et al., 2021). Using case studies, we explore how SIDS have responded to COVID-19, reflecting on the implications of responses for different groups, and on the potential for these coping mechanisms enacted for the pandemic to support long-term resilience to climate change. 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.

This article was written in mid-2021 and only refers to events up until then. We make no assumptions on a timeline to the “end” of the pandemic. Indeed, the “post-pandemic world” of our title does not anticipate a “return to normal,” as the legacy and consequences of the pandemic will inevitably persist long after infection rates fall.

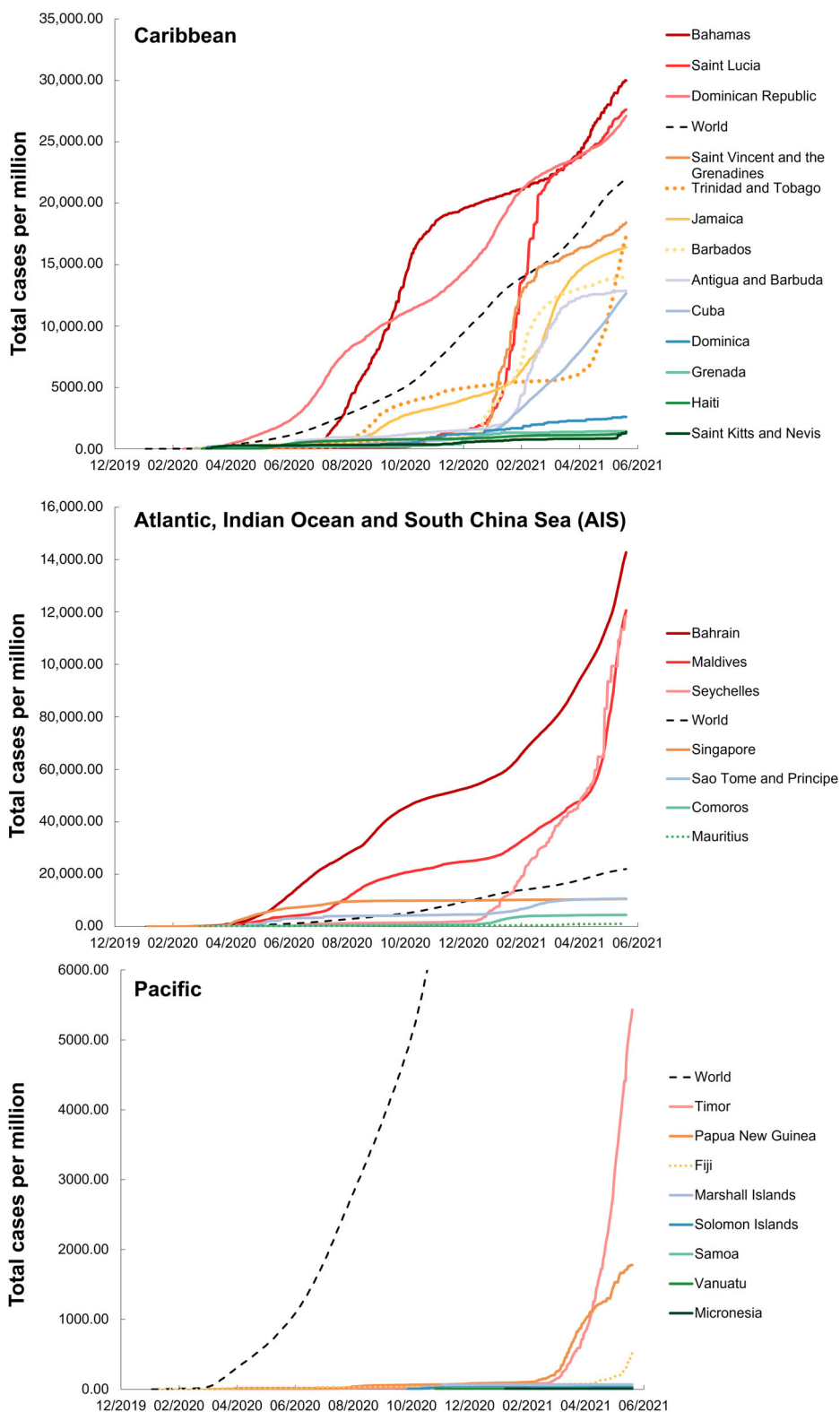


FIGURE 1 Total cases per million for Caribbean, AIS, and Pacific SIDS. Countries designated as SIDS but possessing continental land borders are excluded, given the intrinsic nature of sea boundedness in many of the issues under discussion. Case study countries are indicated with dotted lines. Note the scale change for each region. Countries reporting zero cases: Cabo Verde, Kiribati, Nauru, Palau, Tonga, Tuvalu. Data: COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (Dong et al., 2020), via Our World in Data (Ritchie et al., 2020). Last accessed June 2, 2021

2 | CONVERGING CRISES IN FIJI

Fiji took a decision to close its borders comparatively early (March 2020), which resulted in low numbers of infections but also a massive economic impact in a country where pre-COVID-19, tourism contributed some 34% to GDP and directly employed around 26% of the working-age population (Gounder, 2020; Leal Filho et al., 2020). The almost total loss of tourism revenue and associated unemployment of sector workers since April 2020 has had severe economic impacts on national development planning and knock-on effects on the rest of the Fijian economy. While plans are in place to re-open Fiji to tourism at some point in the future, the outbreak in the country (as of May 2021) appears to be spreading and, while the uptake of vaccinations (through COVAX) is encouraging, this may delay plans for border re-opening and the steady recovery expected to follow this.

Not only has COVID-19 exposed the dangers of economic dependency on tourism for countries like Fiji, but it has also exposed fragilities in national resilience, which historically has been an important component of societal coping with periodic disaster (including tropical cyclones and droughts) here, as elsewhere in the Pacific Islands (Ballard et al., 2020; Walshe et al., 2018). Three tropical cyclones of above-average strength have affected Fiji since the outbreak of COVID; Severe Tropical Cyclone Harold (April 2020) swept across the archipelago, reaching Category 5 as it passed over the southern island of Kadavu, where it destroyed many dwellings and most food gardens; Tropical Cyclone Yasa (December 2020) was labeled “a climate emergency” that left thousands of Fijians homeless; Severe Tropical Cyclone Ana (January–February 2021) was one of three such events to impact Fiji in 2021, causing widespread flooding, forcing temporary relocations, and impacting food production. The incidence of stronger-than-accustomed tropical cyclones is consistent with climate forecast models (Walsh et al., 2016) while the increased frequency of tropical cyclones during La Niña events is generally well established (Chand & Walsh, 2009); a La Niña event affected the region in 2020–2021.

Both the socio-economic impacts of COVID-19 and the uncommonly high occurrence of strong tropical cyclones caused massive disruption to Fiji and has forced many of its inhabitants to reappraise their attitudes towards longer-term climate stressors, especially warming (and its effects on food production) and sea-level rise. It seems unlikely that Fiji will ever revert to its pre-COVID situation in which many regarded climate change as a manageable challenge that would allow continued economic growth (Atkinson-Nolte et al., 2021; McMichael & Katonivualiku, 2020; Walshe et al., 2018). Anecdotally, there is greater pessimism—some might term it “realism”—about the possibility of sustaining existing livelihoods into the foreseeable future. For example, Mangubhai et al. (2021) found that Indo-Fijian small-scale fisheries actors have low expectations of government assistance to recover from COVID-19 and cyclone impacts, due to funding shortages. This is consistent with the findings of research into climate-change linked mental health impacts in SIDS (Kelman et al., 2021). The compound impacts of COVID-19 and three destructive cyclones may be the trigger needed, in Fiji as elsewhere, to embrace a more realistic view of the future and people's place within the environment (Farrell et al., 2020; Hickey & Unwin, 2020).

3 | COVID-19 IMPACTS IN COVID-FREE TUVALU

When COVID-19 cases were confirmed in neighboring Fiji, the Tuvalu Government imposed a ban on non-essential movement of passengers and cargo into and out of the country. Enforcement was comparatively easy because Funafuti (Tuvalu's capital) is the only point of contact with the outside world yet it created difficulties because of Tuvalu's high dependence on imports, especially food and fuel. Challenges included the large number of Tuvaluan citizens stranded overseas and the need for imported medical supplies to cope with a domestic COVID-19 outbreak (Kitara et al., 2020). Repatriation only commenced when the country was equipped to provide quarantine and testing, but even then, limited quarantine accommodation meant that repatriation flights had to be spaced at least 14 days apart. Tuvaluan returnees from New Zealand were required to undergo testing and quarantine in New Zealand, and a further 14 days quarantine in Tuvalu on arrival (Kitara & Farbotko, 2020). Tuvalu's small population, strict rules, plus the fact that Funafuti is the only point of entry by both sea or air, are likely key factors in Tuvalu remaining (May 2021) one of only 13 countries in the world to be COVID-free (Farbotko & Kitara, 2021).

Within Tuvalu, long-term trends in migration from outer islands to Funafuti saw the former depopulated and the latter overcrowded, accommodating >60% of the nation's population. After the start of the pandemic, the Government encouraged outer islanders living on Funafuti to return to their home islands (Farbotko, 2021), paying boat fares of those who agreed. While this measure was in anticipation of COVID-19 arriving on Funafuti, it reduced the island's population by some 25%, achieving a long-term goal of the Government (Te Kakeega, 2015). The Tuvalu Government

also introduced support payments for each resident Tuvaluan (and many overseas) to compensate for loss of employment and the cessation of overseas remittances, on which many Tuvaluan families depend. Businesses in the private sector were supported by suspension of loan repayments (Tuvalu Government, 2020).

Pre-COVID many Tuvaluans worked as seasonal farm workers in Australia or New Zealand (MacDermott & Opekin, 2010) and, although some limited recruitment of South Pacific islanders to carry out this essential work has recently restarted, Tuvalu has not so far been involved. Recruitment has been confined to those Pacific nations able to provide a large labor force and there is a danger that this arrangement will continue post-COVID and that Tuvalu may struggle to maintain a foothold in the competitive Pacific labor market.

4 | DOMESTIC SOLUTIONS FOR FOOD SECURITY IN TRINIDAD AND TOBAGO

Trinidad and Tobago declared a lockdown and border closure on March 22, 2020, with immediate steps taken to provide economic relief to the population over a 3-month period amounting to TT\$6 billion (Government of Trinidad and Tobago [GOTT], 2020). Closure of all ports meant that imports were halted, resulting in less dependency on foreign food, which over the last two decades had risen from 60% to 80% of the country's nutritional intake (GOTT, 2020). Trinidad and Tobago's food import bill was an estimated TT\$4 billion per annum over the last 10 years (GOTT, 2020). Decades of heavy reliance on oil and petrochemical revenues, limited economic diversification and a neglected agricultural sector that became increasingly unattractive to investors and labor resulted in the sector contributing less than 1% to GDP over the last decade (GOTT, 2020).

Trinidad and Tobago re-orientated towards domestic food production during the pandemic, to deal with supply chain disruption. The government allocated TT\$500 million to an Agricultural Stimulus Package and promised to accelerate land tenure, and revisit the use of idle state lands for agriculture. Based on feedback from farmers, many of them were unsuccessful in accessing the fiscal package (M. Mycoo & personal communication to MM, 2021). Agricultural gains were lost with the closure of fast food outlets and restaurants, as the demand for farm produce declined drastically (United Nations [UN], 2020). Many farmers had to dispose of excess produce causing heavy financial losses (UN, 2020). The UN (2020) reported that in a survey by the World Food Programme, 66% of the respondents reported an increase in food prices. The government offered 50,000 vulnerable households free seed packets, distributed hampers of local produce to poor households, and facilitated improved market access by farmers (GOTT, 2020). Although there was an increase in domestic food production, engagement in backyard gardening, an increase in urban agriculture among marginalized segments of the population, and some improvement in food security, food prices escalated as farmers lost income from sales to restaurants and hotels.

Across the Caribbean, the crisis has impacted on consumers' behavior and their perception of the importance of the agricultural sector, prompting reduction of food waste, return to fresh and local products, adaptation of the diet, consumption of new products, and cultivation of food gardens (Blazy et al., 2021). While the COVID-19 crisis had very negative immediate consequences for Caribbean households and food security, it may also contain the seeds for a rising awareness of the need to strengthen food autonomy and modify diets to rely less on imported foods (Blazy et al., 2021; Cheng et al., 2021; Connell et al., 2020). Although the appetite for imported food continues to be high among the Caribbean's wealthy, lower-income households, many of whom suffered job loss, are supporting local farmers due to lower prices of some domestically grown fruits and vegetables. Since the 1990s the Caribbean imports over 60% of food consumed much of which consists of unhealthy ultra-processed foods (Hickey & Unwin, 2020). The links of vulnerability to contracting COVID-19 with co-existing overweight and obesity and other non-communicable diseases, which are high in the Caribbean, may prompt the population to eat more nutritious local produce. However, it remains difficult to predict trends in consumer behavior and food consumption patterns during the post-pandemic recovery period without data and research.

A shift to local food production is a positive outcome but could prove ecologically unsustainable if small farmers engage in unsound agronomical practices, such as slash and burn cultivation and shifting cultivation on hillslopes. Historically, small-scale hillside farming activities have had deleterious impacts such as soil erosion on steep slopes, sedimentation of rivers, flash flooding in low-lying plains, and crop damage and loss (Krishnarayan & Pantin, 2002). Ecological sustainability objectives are articulated in the country's agricultural policies but effective operationalization requires a multi-prong approach inclusive of land redistribution programs, targeted educational programs for farmers using extension officers to deliver training in water and soil management, economic incentives to encourage improved

agricultural practices and the adoption of innovative science and technology. The United Nations Development Programme has partnered with The Cropper Foundation of Trinidad and Tobago to promote a community-based model for sustainable hillside farming aimed at improving crop yields and mitigating environmental threats (Flemming et al., 2015). The low uptake of ecological sustainable practices was traced to low profits made by small farmers despite adopting such measures (Flemming et al., 2015). Small farmers require technical assistance over the long-term as they are key actors in addressing the food and nutrition insecurity challenges facing Caribbean islands, while also minimizing the ecological footprint of food production systems (Saint Ville et al., 2015).

5 | INCENTIVIZING ISLAND ESCAPISM IN MAURITIUS AND BARBADOS

Mauritius followed the “Act fast. Act now. Keep the lights on” approach rather than the act slow immunization strategy (de Melo et al., 2020) to prevent the spread of the virus. With the first COVID-19 cases in March 2020, Mauritian borders were closed, with travel bans from many areas. The first wave of COVID-19 ended in May 2020, after a complete lockdown with stringent mobility measures and significant impact of the tourism sector. While Mauritius has been COVID-19 safe since May 2020, the borders were reopened in October 2020 but since all arriving passengers need to quarantine for 2 weeks, there were few travelers. The average length of stay for tourist in Mauritius is 10.6 days and a 14-day mandatory quarantine had definitely deterred tourist arrivals. Compared to the period January to December 2019, tourist arrivals decreased by 77.7% in 2020. Tourism earnings plunged by 72% in 2020 compared to 2019 (Statistics Mauritius, 2021).

To revive the tourism sector, Mauritius launched a new, 1-year visa, with possibility of further extensions, to encourage long stays. The premium visa targets tourists, retirees, and remote-working professionals. The visitors' main place of business and income must be outside Mauritius, as they are not entitled to enter the labor market. This strategy has so far not provided the required momentum to the tourism industry; the first quarter of 2021 saw a further drastic drop in tourist arrivals by 99.1% relative to the same period in 2020 (Statistics Mauritius, 2021). With a second wave of COVID-19 in March 2021, borders were closed again. Vaccination is seen as the pathway to relaxing travel restrictions and enabling recovery of the tourism sector.

Barbados announced a nationwide lockdown on March 26, 2020, imposed a curfew restricting the movement of people, ordered the closure of all non-essential businesses, and declared that all persons arriving from the United States, its major source of tourists, Europe and the United Kingdom, as well as China, Iran, and South Korea would be placed in quarantine for 14 days upon arrival. The country did not close its borders to commercial airlines, but several international airlines suspended flights to the island. Mass cancellations of both air and accommodation bookings, a dramatic decline in air load and calls from leaders of the source market nations urging their citizens not to travel to the island had a high impact on tourism.

A 12-month Welcome Stamp Programme was launched for visitors who want to live on the island and work remote from their base country. Applicants must earn a minimum of £39,760 (US\$50,000) per year, and have access to health insurance. Applicants also go through national security vetting. The administrative process is rapid, with decisions delivered within a week of applying. Tourists from locations with active and widespread transmission must provide proof of a negative PCR test 7 days before departure, take a PCR test upon arrival, and remain in quarantine until negative tests are returned (Mulder, 2020). The visa scheme is proving especially popular in the United States, United Kingdom, and Canada (Massiah, 2020). Conversely, the concept of “travel bubbles” with countries belonging to the Caribbean Community, which was also explored as a means of improving regional tourism, has not been implemented due to surges in COVID-19 cases in some islands (as of May 2021).

In both cases, the visa schemes represent a re-branding of each country's tourism product of sun, sea and sand into one of a haven relatively safe from COVID-19 with a digital landscape to support overseas professionals working as digital nomads. Similar strategies have been adopted by tourist dependent economies like Dominica, Bermuda, and Antigua, to name a few. But attracting digital nomads to small islands may have negative environmental and economic externalities. While stimulating the hotel sector may result in higher occupancy levels and revenue generation, investments may become necessary to upgrade infrastructure in the digital economy, water and sewerage plants, electricity and telecommunications and health services, while demand for scarce resources such as water may rise. Meanwhile, under the novel visa program expatriates will not be required to pay taxes to the host country but will continue paying taxes to their home countries. It will be crucial to avoid entrenching inequalities between what Sheller (2021) refers to

as the “kinetic elite,” the digital nomad for whom returning to a high-income country may also be an option (Wang et al., 2020), and local communities in lower-income countries hosting them.

6 | CONCLUSIONS

Island responses to the pandemic highlight both new directions and reliance on established coping mechanisms, which might also serve as vehicles for climate action.

The experiences of Trinidad and Tobago highlight that the pandemic may be a catalyst for regional food autonomy. Agriculture is resilient (CEPAL, 2020), but it is vital to consider climate change in this pivot towards self-reliance to ensure long-term climate resilience and ecological sustainability. Climate change impacts such as droughts, high ambient temperatures, heavy precipitation, sea-level rise, and flooding can cause crop damage and loss, thereby disrupting food supply (Lincoln Lenderking et al., 2020). A shift towards systems based on agro-ecological principles and more modern, affordable scientific practices may hold the key to building climate resilient agricultural systems. Climate-smart agriculture can ensure sustainable agricultural productivity and support farmers' adaptation to climate change, but equity concerns must be central in the transformation to ensure that projects meet the needs of poor and vulnerable producers (Karlsson et al., 2018). In island countries like Fiji and other Pacific SIDS with high proportions of rural people sustained by subsistence systems, similar opportunities exist post-COVID for strengthening food autonomy. These might include the revival, often discussed but rarely implemented, of traditional methods of intensified production like irrigated terracing for the production of root crops (Bayliss-Smith & Hviding, 2015; Bocco et al., 2019), which conserves available water, or as raised gardens (*vuci* in Fijian) which are a way for lowland coastal dwellers to adapt in the short-term to salinization of groundwater attributable to sea-level rise (King, 2012; Lata & Nunn, 2012). In addition, the re-appearance of barter as a way for islanders to sustain themselves with cash presents opportunities for people post-COVID in many island contexts to move away from the almost universal use of cash pre-COVID. This is something that governments (and their donor partners) might facilitate, not just to aid recovery, but also in acknowledgement of the manifold dangers of the growing dependency of most SIDS on external funds for both “development” and climate-change adaptation (Nunn & Kumar, 2019; McNamara et al., 2020).

The pandemic also presents new opportunities for transforming the travel industry into a more sustainable tourism enterprise. Greater collaboration across the public and private sectors and across regions can help rejuvenate tourism. Small scale ecotourism holds many possibilities for a more resilient form of tourism which can still generate much needed revenue. COVID-19 has also accelerated changes that were on the horizon, reinforced the need for the island tourism product to adapt more quickly and to embrace digital technology (Spencer, 2021). A new business model which makes travel easier, economical and environmentally friendly and which promotes product and market diversity is central to economic recovery over the long haul. Again, equity must be considered in such a model, ensuring that the benefits are shared with the poorest and most marginalized in society. Development agencies and the donor community can play a crucial role in ensuring that the ongoing post COVID-19 recovery is based on such sustainable and equitable parameters, including designing economic instruments to this end.

However, such possibilities carry risk, and this may not be embraced by an industry seeking to recoup some of the huge losses incurred during the pandemic. The tourism industry may simply revert to old patterns of serving the main established centers of the tourist trade. Additionally, for the most remote SIDS like Tuvalu, competition from more accessible Pacific island countries with the necessary infrastructure and experience (Fiji, Tonga, Samoa, Cook Islands, etc.) limits development as a sustainable tourism destination.

The pandemic may prove a catalyst for climate action, highlighting the fragilities of current systems to climatic and other kinds of shocks, as well as the potential to reimagine those systems in ways that promote resilience and planetary health. A pivot towards self-reliance is evident in some of the responses identified in island case studies, but tourism is still crucial for many SIDS as they seek to recover from the economic shock created by COVID-19, reaffirming the need for connection. Importantly, there is no one-size-fits-all, no single pathway for a climate-resilient COVID-19 recovery. Rather than following a “roadmap,” these case studies highlight that the journey towards a climate-resilient COVID-19 recovery is likely to involve detours, as solutions emerge through innovation and experiment, and knowledge-sharing across the wider SIDS community.

Already, researchers are inferring broad lessons from the COVID-19 pandemic about how to respond to climate change (Fuentes et al., 2020; Herrero & Thornton, 2020), but ongoing efforts are needed to map the context-specific

links between climate action and COVID recovery so that focus on one does not reduce capacity for the other. The COVID-19 crisis has also demonstrated the importance of transparency in building trust, where governments have been tracking infection rates and setting restrictions at local levels, and here, lessons might be learned about how to build and repair relationships across societies that are needed for climate action (Whyte, 2020).

The growing literature on the COVID-19 recovery emphasizes the need to “build back better” (Agrawala et al., 2020; Klassen & Murphy, 2020), suggesting the possibility of reducing vulnerabilities. But experience of rebuilding and recovering from geophysical disasters suggests that often, post-disaster redevelopment further marginalizes the vulnerable by failing to engage with local understandings, priorities and capacities (Rhiney, 2020; Su & Le Dé, 2020). As with any climate policy, it will be essential to place equity at the heart of decision-making (Pelling & Garschagen, 2019) to ensure that actions address the needs of the poorest and most vulnerable.

CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

AUTHOR CONTRIBUTIONS

Aideen M. Foley: Conceptualization (equal); writing – original draft (lead). **Stefano Moncada:** Conceptualization (equal); writing – original draft (equal). **Michelle Mycoo:** Conceptualization (equal); writing – original draft (equal). **Patrick Nunn:** Conceptualization (equal); writing – original draft (equal). **Verena Tandrayen-Ragoobur:** Conceptualization (equal); writing – original draft (equal). **Christopher Evans:** Writing – original draft (equal).

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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