



# Climate change adaptation in small island developing states: Insights and lessons from a meta-paradigmatic study

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## ABSTRACT

This paper describes how an earlier study's novel, meta-paradigmatic approach was used to answer two research questions of international significance: (1) *How are small island developing states (SIDS) adapting to climate change at the national level?* and (2) *What are the factors that affect adaptation at the national level in SIDS?* As acknowledged in the 1992 United Nations Framework Convention on Climate Change and the 2015 Paris Climate Agreement, SIDS are distinct from other developing countries. They are 58 countries spread across three main geographic regions that are disproportionately vulnerable to the impacts of climate change; they require special attention and support from the international community. Previous studies using a single theory to understand adaptation in SIDS were limited and unable to fully grapple with the totality, enormity and complexity of the climate challenge. This paper argues for capitalising on the value of the distinctiveness of different theories and approaches without having to integrate them into one paradigm. It further catalogues the earlier study's contributions to climate change adaptation scholarship and theory-building. It does not seek to rationalise the earlier study or justify any theoretical perspective. Instead, it seeks to serve as an incubator for new thinking on investigating climate adaptation in complex geographies. Additionally, it teases out lessons and insights for national governments and other actors that are designing and implementing climate change adaptation policies and programs in disproportionately vulnerable countries in the Global South.

## 1. Introduction

The fact that the climate is changing is now the basis of global consensus—it is the “defining challenge of our era” (United Nations, 2008, online). Climate change adds “considerable stress” to individuals, social groups, communities, sectors, countries and regions (United Nations, 2016, online). From sea-level rise that increases flood risk to changing patterns of weather that threaten the production of food, its impacts are “global in scope and unprecedented in scale” (United Nations, 2016, online). Without purposeful action at the local, national, regional and international levels, “adapting to these impacts now and in the future will be far more difficult and costly”, not only for today's generation but also for the next (United Nations, 2016, online).

The impacts of climate change are already being experienced by the most vulnerable countries around the world, particularly small island developing states (SIDS). Many SIDS are isolated, and environmentally and economically exposed. Chapter 29 of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), which focusses exclusively on small islands, concludes that, “Current and future climate-related drivers of risk for small islands during the 21st Century include sea-level rise, tropical and extratropical cyclones,

increasing air and sea surface temperatures, and changing rainfall patterns” (Nurse et al., 2014, p. 1616). As many small islands are economically dependent on sectors such as tourism and fisheries, the natural system impacts will negatively affect lives, livelihoods and adaptive capacities in these countries (Nurse et al., 2014). Together, these impacts require SIDS to take urgent action to ensure their sustainability in a changing climate.

Climate change adaptation, according to AR5, is:

“The process of adjustment to *actual or expected* climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects” (IPCC et al., 2014, p. 1758).

Adaptation is one of the two main governance approaches used to address climate change (the other being mitigation). It has two closely-related challenges: (1) adjustments to *actual* climate and its effects, and (2) adjustments to *expected* climate and its effects (Rutherford et al., 2016). The AR5 definition also suggests that adaptation not only includes physical adjustments (as per those required in natural systems) but also political, social, economic and institutional adjustments, as per

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those required in human systems (Rutherford et al., 2016). Javeline (2014) argues that the most pressing adaptation questions do not entirely relate to science but to the interaction of political, environmental, social and economic domains – behaviour and the institutions that facilitate or hinder such behaviour. This suggests that adaptation in human systems is as important as adaptation in natural systems and could even be more pressing, at least in the short term.

National SIDS governments are prioritising climate change adaptation action in order to ensure their sustainable development (Robinson, 2017b). While there have been substantial improvements in the ability and accuracy of climate science to predict and provide relevant data, which has led to a better understanding of the impacts in natural systems, including zonal shifts and the impact of ocean acidification on coral reefs (see e.g. Schmutter et al., 2017), the information base is limited and generally not useful for national policy- and decision-making. This shortcoming is problematic for SIDS, given their heavy dependence on climate-sensitive sectors such as tourism and fisheries. A better understanding of the physical, ecosystem and local socio-economic vulnerability associated with climate change is essential for driving the conversation toward effective adaptation policy- and decision-making at various scales. Despite the importance and urgency of this, there is little evidence in the academic literature about how SIDS, as a group and spread across three different geographic regions, are adapting to climate change. Previous studies using a single theory to understand adaptation in SIDS were limited and unable to fully grapple with the totality, enormity and complexity of the climate challenge. Further, institutional change is not likely to occur until first, the impact of climate change on climate-sensitive sectors in SIDS is fully understood, and second, the challenges associated with mounting adequate, effective and/or sustainable institutional responses to climate change in SIDS are fully grasped and addressed.

This paper describes how an earlier study's novel, meta-paradigmatic approach was used to answer two research questions of international significance: (1) *How are SIDS adapting to climate change at the national level?* and (2) *What are the factors that affect adaptation at the national level in SIDS?* These questions are important because SIDS have been earmarked for special attention and support from the international community and tracking adaptation progress along with its drivers and barriers can have insights for understanding the adequacy, effectiveness and/or sustainability of internationally-supported actions. This paper further catalogues the earlier study's contributions to climate change adaptation scholarship and theory-building. It does not seek to rationalise the earlier study or justify any theoretical perspective. Instead, it seeks to serve as an incubator for new thinking on investigating climate adaptation in complex geographies. This paper also teases out lessons and insights for national SIDS governments and other actors that are designing and implementing climate change adaptation policies and programs in disproportionately vulnerable countries in the Global South.

## 2. Materials and methods

### 2.1. SIDS as a unit of analysis

Using SIDS as a unit of analysis is contentious. The SIDS classification is largely a political construct grounded in the advocacy efforts of the Alliance of Small Island States in the United Nations and in various international policy documents such as the 1992 United Nations Framework Convention on Climate Change (UNFCCC; also referred to as The Convention) and the 1994 Barbados Programme of Action for the Sustainable Development of SIDS, which reiterate the 'special' case of SIDS in terms of environment and development. There is, however, no consensus in the academic literature on how SIDS should be defined; definitions and parameters vary. The United Nations Office of the High Representative for the Least Developed, Landlocked Developing Countries and the Small Island Developing States (UN-OHRLS)

**Table 1**  
List of Small Island Developing States by Region.  
(Based on UN-OHRLS, 2011)

AIMS (N = 9)	CARIBBEAN (N = 29)	PACIFIC (N = 20)
Bahrain	Anguilla	American Samoa
Cape Verde	Antigua and Barbuda	Cook Islands
Comoros	Aruba	Federated States of Micronesia
Guinea-Bissau	Bahamas	Fiji
Maldives	Barbados	French Polynesia
Mauritius	Belize	Guam
Sao Tome and Principe	Bermuda	Kiribati
Seychelles	British Virgin Islands	Marshall Islands
Singapore	Cayman Islands	Nauru
	Cuba	New Caledonia
	Curacao	Niue
	Dominica	Northern Marianas Islands
	Dominican Republic	Palau
	Grenada	Papua New Guinea
	Guadeloupe	Samoa
	Guyana	Solomon Islands
	Haiti	Timor-Leste
	Jamaica	Tonga
	Martinique	Tuvalu
	Montserrat	Vanuatu
	Puerto Rico	
	Sint Maarten	
	St. Kitts and Nevis	
	St. Lucia	
	St. Vincent and the Grenadines	
	Suriname	
	Trinidad and Tobago	
	Turks and Caicos Islands	
	United States Virgin Islands	

unofficially lists 58 SIDS located in one of three geographic regions, namely the Atlantic, Indian Oceans, Mediterranean and South China Seas (AIMS), Caribbean and Pacific (see Table 1). Mysiak et al. (2015) argue that listed SIDS may neither be small, developing nor islands. So while the classification includes countries that share common challenges, including narrow resource bases, small domestic markets, rapid urbanisation and population growth, and fragile environments, they are different in many respects but also provide the basis for a common unit of analysis (UN-OHRLS, 2011).

### 2.2. Research design and questions

The earlier study, which was undertaken between 2014 and 2017 and which produced five peer-reviewed articles (see Section 4), used a mixed methods approach. It drew more heavily on qualitative methods and, therefore, had a strong qualitative component—Johnson and Onwuegbuzie et al., 2004, p. 14), for example, view a mixed methods approach as a “natural complement” to qualitative research. This approach supports the uncovering of contextual and contemporary data (as opposed to historical data)—it is evidence-based and future-oriented, lending itself to highlighting lessons from and for climate change adaptation in SIDS in different regions. The earlier study's mixed method approach was also based on a multiple case study design—three case studies (i.e. various samples of SIDS grouped according to each of the three geographic regions) were nested within one case study (i.e. all SIDS – up to 50 of the 58 SIDS identified by UN-OHRLS). Though case knowledge is just as valuable as general theoretical knowledge (Gerring, 2004), the approach has been criticised for providing little scientific rigour and basis for scientific generalisation (Yin, 2003). As a result of this, it was combined with quantitative methods in order to increase the robustness of the earlier study. Fig. 1 shows an illustrated summary of the research design.

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