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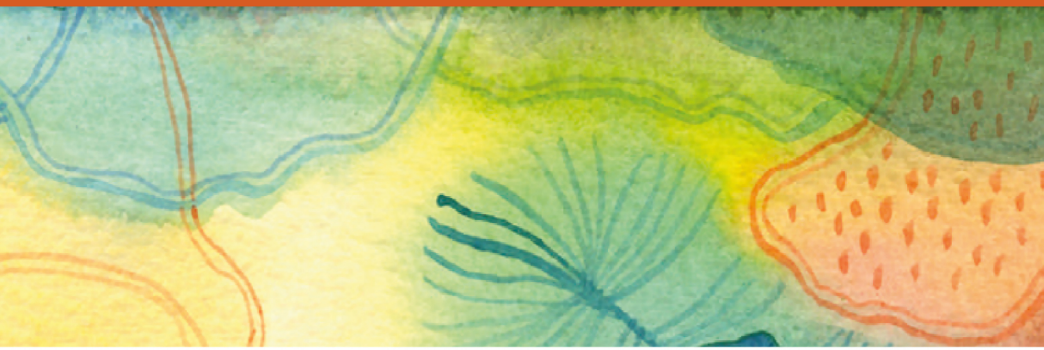

Climate Change, Population Health and Island States

Socio-Cultural Dimensions

EDITED BY
JANAKA JAYAWICKRAMA,
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Climate Change, Population Health and Island States

This unique collection examines climate change, disasters, and human health in both 'developed' and 'developing' island nations, highlighting the sociocultural issues in three countries: the UK, Sri Lanka, and Saint Vincent and the Grenadines.

Examining how domestic and international policies often disregard the contributions which can be made by poor and marginalised communities, the book demonstrates how traditional ecological knowledge systems, which once enabled effective adaptation to environmental variability, have been systematically marginalised through processes of modernisation and globalisation. Furthermore, the book argues that the colonial model of prevention and responses should be reconsidered, advocating instead for a more inclusive, collaborative approach to climate-health governance – one that meaningfully incorporates local perspectives while addressing structural vulnerabilities to develop equitable, context-specific solutions for island states facing the escalating challenges of climate change and disaster-related health risks.

This critical analysis will be of interest to students, scholars, and policymakers in public health, climate change and sustainability, disaster risk reduction, history, anthropology, sociology, and human geography.

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UK). He is the leading and corresponding editor of the following edited book volumes: (i) *Environment, Climate, and Social Justice: Perspectives and Practices from the Global South* (2022; Routledge, UK), (ii) *Social Work and Climate Justice: International Perspectives* (2023; Routledge, UK), and (iii) *Climate Change and Risk in South and Southeast Asia: Sociopolitical Perspectives* (2022; Routledge, UK). His research expertise and interests include environmental sociology, environmental governance, environmental anthropology, environmental justice, climate change adaptation, climate policy, climate justice, and the social and political dimensions of climate change.

Foreword

No set definition of 'island' or 'islandness' exists. Academic discussions and operational differences do not deny island existence and islander experiences. Today, many of these experiences and existences, as highlighted in this important book, revolve around the major challenges of climate change, disasters, and health – as well as their interactions.

For all three, the key ethos is that 'prevention is better than cure', with the unfortunate reality that we so rarely do it. Whether reducing government subsidies to fossil fuel companies or thinking about requesting a doctor's appointment, part of humanity's collective brains often seem to be hardwired into optimism. Do nothing and perhaps it will all work out!

The authors and editors here are more grounded. They compile sociocultural understandings and interpretations of the topics together, especially for island states. They present the riches of what we know already while proffering original knowledge to advance our repertoire of action. They do not accept out-of-date notions by explaining why the phrase 'natural disaster' should not be used and by recognising the anachronism of the 'developed country'/'developing country' dichotomy – which similarly applies to 'Global North'/'Global South'.

This idea and activity collection, while pushing them forward in principle and practice, emerged from island states and islanders. Not just through the academic field of 'island studies' but also by people from islands leading on the world stage to inspire constructive ways forward for redressing risks and threats related to climate change, disasters, and health.

It is more than perils and dangers. Opportunities, winners, and benefits inevitably emerge. Learning from islands and islanders means delving deeply into diverse forms of knowledges and wisdoms. Doing so demonstrates the importance of re-asking key questions and interrogating common answers, based on conversations and investigations.

The fundament is how to reduce the difficulties while creating positive outcomes. Starting points are not necessarily negative. Many, including islanders, rightly wonder if disasters and health risks are increasing, particularly due to climate change, and how bad it might get. As with 'island', no

uncontested or consistent definition of 'disaster' or 'health' exists, nor does any robust counting or classification system help for determining some trends. No disaster, health, or island database could be complete. Adequate data can be absent and, at times, could never be feasible for convincingly calculating and reporting many disaster and health trends.

Examining the crude metric of deaths by hazard demonstrates. The most lethal known earthquake was in 1556. The deadliest pandemic was, at the latest, 1918–1920 and might have been centuries earlier. Total population numbers were far fewer then, making the impacts proportionally huge. More recently, the most lethal storm was likely in 1970, and the most lethal tsunami was likely in 2004. Considering how sparsely populated North Sea coastlines were 8,200 years ago, it is conceivable (but far from certain) that the tsunami from the Storegga Slide had a far greater proportional impact than the 2004 Indian Ocean waves. And any of these statements of the days with the most deaths could change any time.

Health is better in many ways today. Life expectancy is far better than a hundred and a thousand years ago, although huge differences remain among population subgroups. Some places have accessible, competent health-care with ample social prescriptions, medications, and surgery options, extending life and improving quality of living. Too many locations retain pay-to-play, while a condition such as appendicitis or perineal tear during childbirth kills.

The principal action is not to do better at ranking disasters or health risks and comparing them. After all, any disaster or health impact can have horrific results, so caution is needed in presuming that everything is worse today than years or millennia ago. More importantly, we know so much about and have so much experience in avoiding disasters and improving health. A lengthy list of fabulous successes inspires, from cancer treatments to powerful earthquakes and tornadoes with few casualties.

Islanders around the world have led many accomplishments, epitomised in this book's core examples of the UK, Sri Lanka, and Saint Vincent and the Grenadines. They are presented as island states. The UK includes territory across two large islands. Saint Vincent and the Grenadines is an archipelago, with the Small Island Developing States (SIDS) group being more of a political than physical assemblage. What does 'island state' really mean?

Irrespective, much more effort and many more resources could and should be invested in reducing more adverse disaster and health impacts, irrespective of climate change. After all, climate change by definition is merely a change in weather statistics. Since weather is not a baseline cause of disasters, climate change per se does not cause disasters. Many islanders accepting the sea as an extension of their land and home live this, knowing that the weather changes hourly (or more frequently) and the climate changes decadally (or less frequently).

There are enormous, frightening exceptions.

Contemporary human-caused climate change produces weather conditions that modern humanity (since the last Ice Age ended) has never experienced. Heatwaves are reaching realms in which outdoor labour, incorporating agriculture, would be lethal for days, impeding livelihoods and food supplies. If the large ice sheets covering Kalaallit Nunaat (Greenland) and Antarctica melt, then the world's coastlines will be reconfigured over the coming centuries. Long before, rising sea surface temperatures combined with acidifying oceans will have rapidly changed coastal and marine ecosystems.

Subsequent physical, mental, and environmental health impacts must be addressed in tandem with many other environmental changes affecting risks. Since the glaciers from the last Ice Age melted, the loss of this huge mass pressing down on the land has meant that the island of Great Britain continues to readjust, with much of Scotland rising and southeast England sinking (as a geological rather than political statement). Parts of Sri Lanka's coastline were reshaped morphologically and socially due to the 2004 tsunami. St. Vincent continues to prepare for active volcanism, witnessed through major eruptions in 1902–1903, 1979, and 2021. Some Grenadines are eroding from natural shifts and sand mining.

This book layers on social determinants of health, including racism, inequity, poverty, and colonial legacies. Disasters and health are social processes, with risks and opportunities emerging and being managed (or not) through social decisions – namely by the minority with the most political and financial power typically making these decisions for the majority. Too often, adequate risk management is not desired, with human-caused climate change being a huge consequential symptom among several others. At other times, positive action means that no disaster hits the headlines, and no terminal diagnosis is delivered.

To achieve these outcomes, we must adopt this book's lessons. Not just to identify and discuss them but also to learn and apply them for doing better, in and beyond all the islands.

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1 Introduction

Janaka Jayawickrama, Arnab Chakraborty, and Yong-an Zhang

As we embark on the journey of writing this book, we are acutely aware of the pressing challenges our world faces in relation to climate change. Every day, we are confronted with reports of extreme weather events – floods, storms, heavy snowfall, droughts, and heatwaves – that are affecting communities across the globe. For instance, northern England is experiencing unusual snowfall that has disrupted the daily lives of its residents, while in Sri Lanka, unexpected heavy rains are wreaking havoc on agriculture and livelihoods. The Caribbean Islands are just beginning their recovery from the devastating impacts of recent hurricanes. This evolving situation paints a stark picture: climate change has emerged as a critical threat to humanity, escalating into a crisis that we must urgently address. It has been established that climate change creates various natural hazards that impact on various human systems (O'Keefe, O'Brien and Jayawickrama, 2015). It affects social, political, economic, cultural, and environmental systems, thereby creating various challenges for human populations. In this book, we attempt to unpack the climate crisis that spurs disasters and increases health risks. The rising death rates and the emergence of communicable and non-communicable diseases are not just public health issues – they serve as stark reminders of the larger threats looming over human existence.

From the onset, we want to clarify that our perspective in this book is distinct. We strive to move beyond a conventional anthropocentric world view, advocating for an understanding that recognises our humanity as part of the intricate web of nature that governs our planet. Although human beings have evolved to become the most intelligent animal on this planet over the past two million years (Bingham, 2000), we find ourselves facing difficulties in fostering harmony both within ourselves and with the natural world (Smith and O'Keefe, 1980). In 2018, the Intergovernmental Panel on Climate Change (IPCC) asserted that to likely limit global warming to 1.5°C, greenhouse gas emissions would need to be decreased by 2030. However, as we are just five years away from this target, achieving this seems impossible. While the most powerful countries are neglecting their responsibilities in terms of climate targets, the poorer and smaller countries are experiencing the most burden of the crisis.

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It is crucial to understand that the themes explored in this book possess an inherent political dimension. Although there is some presence of political discourse in climate change, disasters, and health studies (Smith, 2006; Jayawickrama, 2023), there is often a lack of deeper political analysis. Most contemporary research examines the challenges of the climate crisis and related disasters without considering the political forces at play. We aspire to weave a rich tapestry of political perspectives throughout our book – from global to local. Some discussions will delve into colonial and historical contexts, while others will address contemporary issues in anthropology and human geography. It's paradoxical that, despite the recognition of public policy as a significant determinant of health, the intersection of climate change, disasters, and health lacks robust mainstream debate on the political underpinnings that shape these issues.

This book argues that challenges related to climate change, disasters, and health are fundamentally political. The following are some reasons that can describe the political nature of climate change, disasters, and health:

- Some groups are more vulnerable to climate change, disasters, and maintaining their health due to inequalities rooted within global and local political structures.
- Social determinants of health are closely linked to political interventions and are thereby dependent on political action (or inaction).
- In many countries, not all citizens enjoy the fundamental "right to life" (United Nations, 1948) due to political instability and related socio-economic challenges.

In summary, the climate crisis, along with its thrilling challenges and health implications, is inherently political. The dynamics of power shape these issues as integral parts of a broader mosaic of social, economic, cultural, political, and environmental systems. To inspire meaningful change, we must cultivate political awareness and resilience. Together, let's engage with these issues, fostering hope and action in the face of adversity.

Climate Change, Disasters, and Health

According to Todorov (1986, p. 259):

> The question of climatic change is perhaps the most complex and controversial in the entire science of meteorology. No strict criteria exist on how many dry years should occur to justify the use of the words "climatic change". There is no unanimous opinion and agreement among climatologists on the definition of the term climate, let alone climatic change, climatic trend or fluctuation.

This was in the 1980s, and even today, according to IPCC (2018), climate change can be understood as a change in the state of the climate, identified through observation. In this understanding, changes can be defined as the variability of climate properties and that persists for an extended period, generally for a decade or longer. It is acknowledged that climate change results from both natural processes and human-induced activities. Furthermore, the UN Framework Convention on Climate Change (UNFCC, 1992, Article 1) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and which is in addition to natural climate variability observed over comparable time periods". A key aspect of these definitions of climate change is that the recognition of human interference with nature and natural processes. The contemporary challenges posed by climate change can be traced back to a lack of harmony between the processes of life and the "system" of life. This tension makes the human population ill-equipped to tackle both general life challenges and existential threats like climate change.

In our current era, where science, technology, and a market-oriented lifestyle converge, humanity is attempting to reshape nature through infrastructure development and urbanisation, often disregarding natural settings and processes (Smith and O'Keefe, 1980). In the pursuit of controlling nature, humans have changed their organic relationship with nature into one of dominance. However, this control over natural processes has never been fully achieved because nature operates beyond human capabilities. The problem remains that science and technology, which are supposed to solve the problems of disasters, including the challenges of climate change, and improve health and wellbeing continue to increase risks and challenges. For example, building human habitats in floodplains increases the risk of flooding, while oil exploration in the ocean and fracking heighten the likelihood of earthquakes. We argue that, instead of fostering a harmonious and responsible human community, science and technology continue to create new challenges and risks. As argued by Jayawickrama (2023), science and technology are inadequate to provide resolutions to challenges caused by climate change, including disasters and health problems. One of the major reasons for this is that the mainstream positivist science that has originated in Europe and North America is congested with conflicting understandings of nature and natural processes. Obviously, human beings are part of nature; however, due to these conflicting understandings, they tend to see nature as an external phenomenon to human population. It is crucial to recognise that science is also a belief about how the world operates and a social construct (Zelinsky, 1975).

According to the Glossary of IPCC (2018), a disaster is defined as extreme changes in the normal operations of a society due to physical hazards such as floods, droughts, and earthquakes that interact with vulnerable conditions leading to the destruction of social, political, cultural, economic, and

environmental structures that require emergency responses to protect human needs and safety as well as support for recovery. It is also generally accepted among various academics and scholars that disasters are not natural (Kelman, 2024; Wisner, Gaillard, and Kelman, 2012; Smith, 2006; O'Keefe, Westgate, and Wisner, 1976). Instead, in every phase and aspect of a disaster management cycle – preparedness, response, and reconstruction – people's vulnerabilities and causes of disasters are rooted in social, political, cultural, economic, and environmental contexts. Smith (2006), in his critical examination of Hurricane Katrina in 2005, argued that who lives and who dies from a disaster is largely decided by sociopolitical systems rather than by nature. Niel Smith in his article, "There's No Such Thing as a Natural Disaster" (2006) further explained that in New Orleans, especially among ethnic minorities, people renamed Hurricane Katrina as "Hurricane Bush". In 1976, a deadly earthquake killed 23,000 people in Managua City in Guatemala and displaced 1.5 million people. Interestingly, most deaths occurred not from the earthquake itself but in the weeks that followed. Despite a significant international relief effort, the poorest and most affected populations received little assistance. O'Keefe, Westgate, and Wisner (1976) described the earthquake as a "class-quake". Similar challenges were observed during the 2004 tsunami disaster in Sri Lanka and India, and the 2015 earthquake in Nepal, where responses and interventions were obstructed by sociopolitical factors from local to national levels. It is evident that, whether in the Global North or Global South, survival after disasters is influenced by ethnicity, social class, and race.

In this context of climate change and disasters, it is important to understand the delivery of health, including public health, has political implications. There is a growing recognition of social determinants of health as contributing and determinant factors to the health and wellbeing of human beings. However, the political dimensions of health and the influence of politics on healthcare delivery have rarely been discussed in academic and policy domains (Bardhan et al., 2021; Navarro et al., 2006). While the United Nations (1948) states that the living standards for health and wellbeing are a human right, it is obvious that diseases disproportionately affect some groups or even nations than others (Chakraborty, Jayawickrama, and Zhang, 2024). In 2020, Dawes provided a useful definition of political determinants of health as "involving the systematic process of structuring relationships, distributing resources, and administering power, operating simultaneously in ways that mutually reinforce or influence one another to shape opportunities that either advance health equity or exacerbate health inequities" (p.44). To work towards reducing health inequalities, both national and local political will (policy) and political movement (implementation) are necessary. While we subscribe to the WHO (1948) definition of health as a state of complete physical, mental, and social wellbeing, we also contend that factors like poverty, uneven development, and climate change are political issues relevant to each context. For example, a farmer in North Central Sri Lanka may be unable to farm due to extreme

drought, leading him to commit suicide due to his inability to repay debts. A woman who migrated to Kingstown in Saint Vincent and the Grenadines may lose her home due to cyclone and be unable to find work, suffering from hypertension and lacking access to healthcare due to financial constraints. In the Northeast of England, a family may experience severe flooding, losing all their possessions. The mother, a recovering alcoholic, may relapse, resulting in family turmoil. These examples illustrate that climate change and health risks are intertwined with politics and policies relevant to each context.

Why Island States?

Island states, also known as island countries, are landmasses surrounded by water. They are made up of one or more islands. Many island states, such as Sri Lanka, are made up of a single island, while others, like Saint Vincent and the Grenadines, are collections of islands, known as archipelagos. Some island countries, such as the UK, are single islands that share borders with others. According to the World Atlas (2025), there are 47 island countries in the world. Although geographically a landmass surrounded by water, many geographers do not classify Australia as an island state. Island states are unique due to their locations and geographical characteristics. Most island states are small and sparsely populated; however, some are medium to large islands with substantial populations. According to World Population Review (2025), Indonesia is the largest island state in the world with over 225 million people. However, it is important to understand that due to the low population density of most island states, there is a lack of global attention on their challenges to climate change, poverty, and uneven development.

Currently, many island states are at risk of disappearing within a few decades, primarily due to the climate crisis and rising sea levels. This situation could render these islands uninhabitable for human populations and may ultimately lead to their extinction. The human aspect of this crisis involves the potential displacement of populations without a home country. Most of the island countries likely to disappear are classified as small island states struggling with uneven development and poverty. According to the United Nations (2025), there is increasing focus on Small Island Developing States (SIDS). SIDS comprise a unique group of 39 countries and 18 associate members of the UN regional commissions that face specific social, economic, political, cultural, and environmental challenges. Additionally, many island states, especially SIDS in the Caribbean region, are rich in biodiversity as well as habitats for many important species that maintain natural processes (Birchenough, 2017). Results of the climate crisis conditions such as extreme weather patterns, including hurricanes, increased coastal water temperature, rising sea levels, and coastal zone inundation, threaten all living beings and non-living things in island states. The rising vulnerabilities of island states to climatic challenges are particularly damaging since many island states are home to rich species diversity. In many ways,

biodiversity loss undermines the productive and adaptive capabilities of island territories and marine ecosystems, which in return elevate their vulnerabilities to environmental hazards. From a human perspective, this threatens food security (both agricultural and fishing) as well as economic security since most island states depend on tourism based on coastal ecosystems.

Considering this context, we decided to focus on island states by examining three distinct yet interconnected case studies. The UK is a large island state and considered a developed country with many social, cultural, political, economic, and environmental complexities. Sri Lanka is an island state that has been struggling over the past 77 years with many civil upheavals, conflicts, and disasters to maintain development. Saint Vincent and the Grenadines, which is an archipelago, has been facing many challenges related to natural hazards and uneven development. The main linkages of all these three case studies are their historical connection to the European colonial project; the British Empire colonised both Sri Lanka and Saint Vincent and the Grenadines, and all three countries continue to grapple with various legacies of colonialism. While researching for this book, we also realised that the UK has a lack of literature and research as an island state. This finding adds an interesting dimension to our research process. Furthermore, we noted that as a country in the Global North, the UK has rarely been compared with nations in the Global South, especially concerning climate change, disasters, and health risks. These comparative aspects are further elaborated in Chapter 2.

Methodological Approach

This book takes a multidisciplinary and interdisciplinary approach to its methodology. It includes literature from various fields such as human geography, history, anthropology, sociology, political science, and economics, as well as policy and evaluation literature from the governments of the UK, Sri Lanka, and Saint Vincent and the Grenadines, alongside documents from the United Nations. Our methodological approach reflects this multidisciplinary and interdisciplinary nature. We have aimed to examine climate change, disasters, and health risks in three distinct yet interconnected island states. The ideas and scholarship presented in this book shed light on the realities of these case studies. By situating these case studies within a broader analysis, we draw on intellectual debates and disciplinary frameworks related to climate change, disasters, and health. This analysis considers social, political, cultural, economic, and environmental dimensions in both global and local contexts.

What Is This Book About?

This book aims to foster a dialogue about climate change, disasters, and health risks in island states that are often overlooked in larger discourses. Its purpose is to provide a critical analysis of the social, political, cultural, economic, and

environmental challenges related to climate change, disasters, and health risks in the UK, Sri Lanka, and Saint Vincent and the Grenadines. Each case study offers unique insights into the local realities and encourages readers to engage with the material to better understand the challenges and potential solutions from academic, policy, and practical perspectives.

The central argument of this book is that human populations must cultivate a harmonious relationship with nature to mitigate health risks arising from climate change and disasters. However, current global policies and practices do not necessarily facilitate this, especially within island states. This book takes the reader through the changing nature of health risks related to climate change and disasters, environmental racism, and present and future complexities in island states. By examining the mainstream concepts as well as sociocultural definitions of climate change, disasters, and health risks, we conclude with an argument for the need to create a global community that recognises personal and interpersonal relationships, as well as their connection to nature.

This book presents various historical and contemporary case studies to elaborate on the challenges faced by researchers, policymakers, and practitioners working on climate change, disasters, and health in island states. Furthermore, it attempts to promote a better understanding of the global burden of climate change and disasters on health in these regions. It encourages readers to critically think about the issues of poverty, inequalities, and uneven development, and how that increases health risks through climate change and disasters.

Overall, this book provides a critical analysis of climate change, disasters, and health risks in island states regardless of their development stages. This book will be of interest to students, scholars, policymakers, and public health and environmental protection practitioners in understanding climate change, disasters, and health risks.

Flow of the Book

This book consists of six chapters, including an introduction and a conclusion. As editors, we have aimed to establish a logical flow through these multidisciplinary and interdisciplinary chapters. Chapter 1, Introduction, sets the stage for the topics discussed. Chapter 2 examines climate change, disasters, and health risks specifically in the context of island states. It highlights the similarities, differences, and interconnectedness of the UK, Sri Lanka, and Saint Vincent and the Grenadines. This chapter argues that a holistic understanding and a collaborative approach are essential for addressing health risks related to climate change and disasters in island states. Chapter 3 critically explores how people understand climate change and health in the UK, including the impact of environmental racism on inequality and social justice. The chapter underscores the value of alternative epistemic approaches, which encourage a rethinking of human relationships with nature as a foundation for achieving

social justice. Chapter 4 analyses how social, cultural, and religious beliefs influence perceptions of environmental and climatic changes, as well as health risks in Sri Lanka. By examining examples from Sri Lanka, this chapter suggests that a deeper understanding of sociocultural dimensions is crucial for developing effective policies and strategies applicable to the broader global community engaged with island states. Chapter 5 focuses on Saint Vincent and the Grenadines, a SIDS particularly vulnerable to climate change and related disasters that heighten health risks. This chapter emphasises the need for data-driven research, especially from a bottom-up perspective, to better understand how inequalities increase the vulnerability of marginalised communities to the health risks associated with climate change and disasters. Finally, Conclusion reviews the key ideas discussed in the previous chapters and argues for an urgent need to foster a human community capable of living harmoniously with each other and with nature. This is particularly pressing for island states, regardless of their size or level of development. The existing social, political, cultural, and economic frameworks need to be re-evaluated in light of current inequalities, both globally and locally. The book concludes by asserting that the heightened health risks linked to climate change and disasters stem from human activities, particularly uneven development, which often overlooks the strengths of marginalised populations. Therefore, it is imperative for human beings to cultivate a sense of duty and responsibility towards one another and the natural environment.

An Ongoing Collaboration

This book is the second in a series focused on thematic research concerning diseases, health, and wellbeing. The research is organised by the Research Centre for Health and Wellbeing and the International Center for Drug Policy Studies at Shanghai University. The World History Group within the College of Liberal Arts at Shanghai aims to expand the boundaries of historical research, generating ideas that contribute to solving contemporary challenges facing humanity and our only home – Planet Earth. The goal of this thematic research programme is to critically examine key concepts related to diseases, health, and wellbeing beyond dominant epistemological perspectives. Our research engages with like-minded scholars from around the globe. In an increasingly divided world, it is a joyful experience to engage with diverse epistemological viewpoints. Our debates, arguments, and discussions facilitate analyses that transcend linear Western scientific traditions.

The editors of this book – Janaka Jayawickrama, Arnab Chakraborty, and Yong-an Zhang – bring different disciplinary backgrounds to this research. Janaka is a social anthropologist with experience in policy and practices related to disasters, conflicts, and uneven development. Arnab is a medical historian with broad interests in people and society, while Yong-an is a health

historian with extensive experience in drug policy, traditional medicine, and contemporary challenges related to population health. Having grown up in Sri Lanka, India, and China, respectively, we appreciate that issues of disease, health, and wellbeing are grounded in social, political, cultural, economic, and environmental contexts. Our location in Shanghai, one of the world's largest seaports and a major industrial and commercial centre in China, enables us to collaborate with individuals globally, regardless of place, nationality, religion, qualifications, gender, class, or background. This exemplifies the intellectual freedom to collaborate with those who share similar values and attitudes.

Karl Atkins is a professor of medical sociology in the Department of Sociology at the University of York, UK. He has a background in conducting qualitative ethnographic research in multidisciplinary and culturally diverse settings, with extensive fieldwork experience in the UK and India. Idelia Ferdinand, a specialist in disaster management and sustainable development from the Government of Saint Vincent and the Grenadines, received her training at Northumbria University in the UK and obtained her doctorate in 2013. Over the past 25 years, she has collaborated with communities affected by climate crises and disasters in the region. Devendraraj Madhanagopal, who grew up in Tamil Nadu, Southern India, earned his doctorate in sociology from the Indian Institute of Technology, Mumbai, in 2018. He currently serves as Assistant Professor (I) in the School of Sustainability at XIM University, Odisha, India, where he conducts research on climate change, gender, disasters, development, and governance from community perspectives.

Combining the disciplines of sociology, anthropology, history, environmental science, and human geography has been a challenging yet rewarding task. Our friendships and mutual willingness to listen as equal collaborators have contributed to the success of this book. We faced many challenges throughout the process, including hurricanes, cyclones, heatwaves, and the need to establish a cohesive rhythm for this book. Karl's compassion and care, Idelia's ability to respond during times of power outages and displacement, and Devendraraj's eagerness to learn new ideas have all facilitated the smooth completion of this work. In editing this book, we did not adhere strictly to a universal chapter format. Each chapter reflects the distinctiveness of the authors' disciplines, backgrounds, and experiences. As editors, we focused on the content, concepts, arguments, and ideas presented. This book stands as a testament to true interdisciplinary and multidisciplinary collaboration.

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2 Understanding Climate Change, Disasters, and Health Risks in the Context of Island States

Janaka Jayawickrama and Arnab Chakraborty

The Planet Earth – our home – is changing rapidly. Not necessarily the planet itself but the human population. Our social, political, cultural, economic, and environmental structures – both locally and globally – are rapidly changing. Regardless of making a judgement of good or bad, what we want to point out here is that these changes do not include nature and natural processes.[1] In any urban setting, we cannot survive without plastic, using vehicles, building structures, and using chemicals that negatively impact nature and natural processes. In that, we are attempting to provide a different perspective on climate change, disasters, and health risks in the context of island states.

We wanted to focus on island states because they are one of the most vulnerable locations to natural hazards as well as the climate crisis. Also, islands are home to the most diverse plant and animal species in the world. We also wanted to push the discourse of island states beyond SIDS such as Barbados and Nauru. We wanted to bring attention to the island states such as Japan, Indonesia, the United Kingdom (England, Wales, Scotland and part of the island of Ireland), Sri Lanka, and many others. Apart from the natural and environmental reasons, there is also a political aspect to this attempt. For example, the British Empire of the United Kingdom has been a coloniser of many countries of the world. Although as island state, we normally do not discuss the UK in that context. However, we want to bring the impact of the UK on other islands such as Sri Lanka and Saint Vincent and the Grenadines, as well as its policy impacts on their own people.

This book does not claim to provide all the answers to the problems of climate change, disasters, and health risks in the context of island states. However, this book can be used as a facilitating tool for discussions, debates, and dialogue. In that, this chapter establishes our definitions for climate change, disasters, health risks, and island states throughout the rest of the chapters. Further, we attempt to provide an explanation and justification for examining climate change, disasters, and health risks in the context of island states.

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Climate Change as a Climate Crisis

According to the United Nations Framework Convention on Climate Change (UNFCCC, 1992, p. 3), climate change can be understood as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

However, understanding climate change is a difficult task, which is not just scientific but also sociopolitical at both local and global levels. Todorov (1986, p. 259) expresses this difficulty in a much more refined language:

> The question of climatic change is perhaps the most complex and controversial in the entire science of meteorology. No strict criteria exist on how many dry years should occur to justify the use of the words "climatic change". There is no unanimous opinion and agreement among climatologists on the definition of the term climate, let alone climatic change, climatic trend or fluctuation.

In both scientific and public discourse, the concepts of climate change are often used lightly, and it remains unclear what exactly is understood by different definitions. This uncertainty of definitions is problematic because they lead to considerable confusion over the existence and extent of the climate crisis. Defining climate change and climate crisis is conceptually useful; however, how useful they are for policymaking, implementation, monitoring, and evaluation remains a challenge.

In our reading, various research processes leading to various definitions of climate change have been following two very different paradigms. The more authoritative paradigm is the top-down approaches, which lean towards more quantitative methods (Swart and Vellinga, 1994; Parry and Carter, 1998). These approaches take prescriptive methods and focus on the quantitative indicators of physical and geographical vulnerabilities based on scenarios of future socio-economic as well as environmental changes that are used as inputs to a series of hierarchical models. These approaches pay less attention to adaptation and dealing with problems that are based on climate change. The bottom-up approaches concentrate on the social, economic, political, and cultural vulnerability of individuals or communities to both existing climate challenges and future climate crises. These approaches employ more qualitative methods and often examine the social, political, economic, and cultural determinants of vulnerabilities across a region or between individual categories such as women and people with disabilities. They frequently concentrate on indicators of risks and vulnerabilities such as poverty and underdevelopment, lack of empowerment, and lack of access to healthcare services (Bohle et al., 1994; Adger, 1999; Collins et al., 2015). These approaches also examine

how individuals and communities have coped in the past with climate-related hazards as guiding experiences to understand future capacities and behaviours (Meyer et al., 1998). In contrast to top-down models, the bottom-up processes implicitly recognise the adaptive capacities of individuals and communities.

It is important to understand that science is a social construct and proven to be insufficient in dealing with risks and challenges in the contemporary world (Zelinsky, 1975). We argue that the climate crisis, which is threatening humanity, cannot be dealt with only by science. Attfield (2014) argues that science brings inadequate resolutions to threats and risks. McMichael et al. (2004, p. 1546) point out that empirical science may not provide the timely information needed to deal with the climate crisis:

> Climate change occurs against a background of substantial natural climate variability, and its health effects are confounded by simultaneous changes in many other influences on population health. . . . Empirical observation of the health consequences of long-term climate change, followed by formulation, testing and then modification of hypotheses would therefore require long time-series (probably several decades) of careful monitoring. While this process may accord with the canons of empirical science, it would not provide the timely information needed to inform current policy decisions on GHG emission abatement, so as to offset possible health consequences in the future.

Regardless of these various debates, climate change and related crises are accelerating where humanity is facing risks and threats. These can be viewed in two different ways. First, the immediate risks exist from increasingly severe weather events and hazards. Second, the long-term risks are making the planet inhabitable. Although, the global community has recognised these and through the UNFCCC has tried to develop possible solutions. Progress, however, has been painfully slow.

In this backdrop, we argue that climate change and climate crisis are an existential challenge to human population. As pointed by Smith and O'Keefe (1980), the Industrial Revolution in the 18th century pushed the human civilisation to be disconnected from the rest of the natural world. Increasing technological hazards, conflicts and wards, underdevelopment and poverty, as well as individual human greed have prevented the human population from establishing a harmonious relationship with nature and natural processes. As argued by Jayawickrama (2023), imagine a world without birds and insects. The ecosystems will be broken, and human population would struggle to find food and resources. In the same line, imagine a world without human beings. The easy imagination is that this planet would flourish.

If insects, earthworms, or birds were to suddenly disappear from the Earth, it is highly likely that ecosystems – and by extension, human civilisation – would face profound challenges to their continued existence. Food supplies

would diminish, essential ecological processes would be disrupted, and environmental degradation would accelerate. In contrast, if the human population were to vanish, it is not difficult to envisage the natural world flourishing in our absence. This stark comparison underscores an uncomfortable truth: human beings are becoming increasingly irrelevant to the planet's ecological balance. Rather than contributing positively to natural processes, humanity has largely acted as a destructive force.

From this perspective, climate change is aptly characterised as a climate crisis, one that stems from the human population's fundamental inability to coexist harmoniously – with the self, with one another, and with the natural environment. Core societal structures – including mainstream education systems, healthcare models, political institutions, economic frameworks, and modes of livelihood – are predicated upon division, competition, discrimination, and the relentless pursuit of wealth. These systems often lack the philosophical or practical foundations to foster cooperation with nature (O'Keefe, 2020; Jayawickrama, 2023). Accordingly, the climate crisis is not simply a consequence of changing atmospheric conditions but a manifestation of human-induced systemic failures. Rather than attempting to manipulate or control natural systems, meaningful responses to climate change require a fundamental transformation in how humanity perceives and positions itself in relation to the natural world. To address climate change effectively, human civilisation must undergo a paradigm shift – one that prioritises humility, cooperation, and submission to the rhythms and limits of nature.

(Un)Natural Disasters

According to the United Nations Office for Disaster Risk Reduction (UNDRR, 2025), disasters are serious disruptions to the functions of communities or societies at any scale due to hazards such as floods, hurricanes, earthquakes, and droughts with situations of exposure, vulnerability, and capacity, leading to one or more of human, material, economic, and environmental losses and impacts. Further, the UNDRR explains that the impacts of a disaster can be immediate and localised; however, they are often widespread and could last for a long time. The impacts may put pressure on the capabilities of a community or society to effectively deal with them by using their own resources and therefore may require external assistance.

Building upon our framing of the climate crisis in the preceding section, it becomes evident that prevailing definitions of disasters tend to centre exclusively on human populations and the social, political, cultural, economic, and environmental structures they inhabit. This anthropocentric perspective positions nature and natural processes as external to human society – a conceptual separation that is deeply problematic. Human systems largely function independently of ecological systems while simultaneously extracting and exploiting natural resources, thereby reinforcing a false dichotomy between

humanity and nature. Moreover, human systems – particularly urban development and large-scale infrastructure projects – exert considerable pressure on ecological processes. For instance, in Sri Lanka, the expansion of highways has disrupted local ecosystems, leading to a notable increase in peacock and monkey populations within urban areas. These animals, displaced from their natural habitats, are now perceived as nuisances or threats to human activity, prompting calls for their removal. This response reflects a failure to acknowledge the consequences of human encroachment on nature.

A similar pattern can be observed in the UK, where housing and settlements are frequently constructed in areas prone to flooding. Wetlands, which play a critical role in groundwater replenishment and flood mitigation, are being filled and developed without adequate consideration of their ecological value. Local governmental responses often prioritise flood prevention infrastructure over the preservation and restoration of wetland ecosystems. In Saint Vincent and the Grenadines, the tourism industry is contributing to the degradation of coastal and marine ecosystems through the encroachment of hotel developments. While rising sea levels and climate change threaten this infrastructure and the livelihoods it supports, policy responses remain largely focused on safeguarding human settlements rather than addressing the root causes of ecological disruption. In all three contexts – Sri Lanka, the UK, and Saint Vincent and the Grenadines – there is a persistent emphasis on human needs to the exclusion of the natural systems upon which they ultimately depend.

A pivotal moment in the reconceptualisation of disasters occurred in 1976, when a young British academic, Phil O'Keefe, visited Managua, Nicaragua, following a devastating earthquake that claimed 23,000 lives and displaced approximately 1.5 million people. O'Keefe observed that the majority of deaths did not result from the earthquake itself but rather from the conditions and responses in the aftermath. Despite the scale of the international humanitarian response, aid failed to reach the most severely affected populations, particularly the poor. These communities came to refer to the event not as a natural disaster but as a "class-quake", highlighting the socio-economic disparities that shaped vulnerability and mortality. In collaboration with his colleagues, O'Keefe later articulated a groundbreaking thesis: that "there is no such thing as a natural disaster" (O'Keefe et al., 1976). Echoing this perspective, we argue that at every stage in the disaster cycle – origins, vulnerability, preparedness, impacts, response, and reconstruction – the outcomes are shaped by the underlying social, political, cultural, economic, and environmental context. It is this context, rather than the hazard itself, that determines who suffers, who survives, and how communities recover.

Based on the discussions, research, and works of Phil O'Keefe in collaboration with Middleton and others (1976, 1998), Neil Smith (1983), Robert Kates (1997), Walter Rodney (1973), Ponna Wignaraja (1991), Vandana Shiva (1991), Twigg (2015), Kelman and West (2009), and many others, we define disasters as an event when a natural hazard impacts on human systems. While

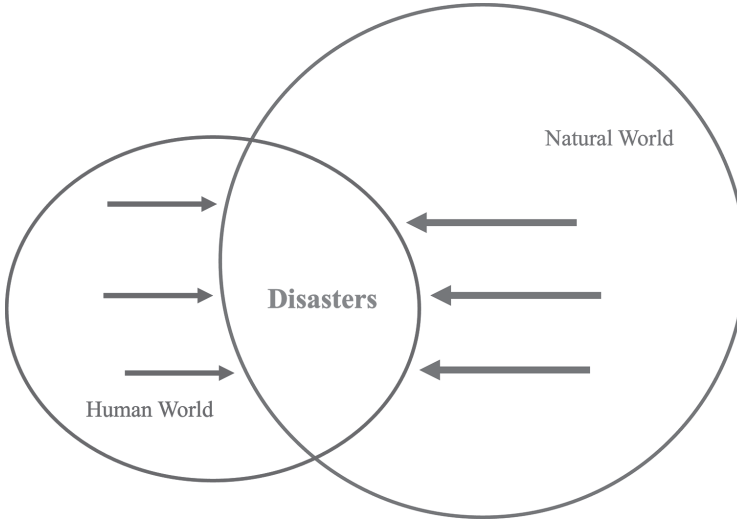

Figure 2.1 Understanding Disasters.

this definition is not different from the UNDRR definition, the point we make here is that when human systems are pushing natural processes, the pushback of nature give rise to disasters. It is similar to building houses on a flood plain or hotels in the coast. Natural hazards continue with or without human beings. For example, an earthquake in the middle of a dessert is not a disaster unless it impacts on human systems (Figure 2.1).

While recognising the value of scientific research and top-down approaches, we seek to emphasise the equal – if not at times greater – importance of the lived experiences of human populations in understanding disasters. Submitting to nature and its processes does not imply the dismissal of human concerns. Rather, our argument is that understanding human vulnerability and risk must be grounded in the recognition that we are not separate from nature but inherently part of it and subject to its processes.

Health Risks

According to the World Health Organization (WHO, 2024), health risks can be understood as a combination of many factors. Whether an individual is healthy or not, health is determined by their environment and context. In that, factors such as habitat, the state of the environment, genetics, income, education level, and social relations all have significant impacts on health. Further, factors such as access to healthcare services and use of medication often have an impact. In essence, the WHO (2024) point that the social and economic

environment, physical environment of the individual and communities, and the individual characteristics and behaviours are common determinants of health. It is important to understand that WHO in 1948 defined health as "a state of complete physical, mental and social wellbeing". When we examine the health risks within this definition, the evolving nature of human living and life, especially in the contemporary world, becomes problematic. An individual is considered healthy when they maintain complete wellbeing – encompassing social, mental, and physical health – within their social, economic, and physical environments, as well as their personal characteristics and behaviours. Given the global and local challenges such as income inequalities, underdevelopment, and poverty, health risks within this scenario increase with less possibilities to decrease. Many traditional and ancient medical philosophies from Asia, Africa, and Latin/South America however provide a different perspective to this. For example, *Sushruta Samhita*, the ancient Ayurvedic textbook of medicine and surgery of 6th century BC provides one of the oldest definitions of health – quality rest, a sufficient ratio of food intake to stool output, and a harmonious relationship with society, and nature regulates health (Lad, 2002). This definition is a combination of individual responsibility of health with their harmonious relationship with society and nature, which allows them to identify what they must do to adjust their personal terms (Johnson et al., 2010).

What is important here is to understand the changing nature of human relationship to nature, which connects to climate change and related health risks, especially diseases and illnesses. According to the Association of Faculties of Medicine of Canada (AFMC, 2017), disease can be understood as a divergence from normal health that originates from an identifiable pathological process, where the patient experiences illness. In that, illness is a subjective sense of feeling unwell that encourages an individual to seek advice from a medical professional. Within these definitions, understanding health risks within the climate crisis has become an important aspect because there is a need to examine risk factors, vulnerabilities, and priorities for policies to facilitate adaptation and mitigation. The WHO (2014) predicted that there will be five million additional deaths between 2030 and 2050 from the climate crisis. We argue that this is an underestimation because this estimation does not consider the increased climate change exposure from population growth, increased poverty and inequalities, unplanned urbanisation, ageing, and migration. Smith et al. (2014) argued that the health risks from the climate crisis are increased by socio-economic inequalities. Perry et al. (2019) argue that social marginalisation, forced invisibility of external and internal migrants, uneven development, neglected diseases such as Dengue and Yellow fever, under-resourcing of health services, and uneven climatic monitoring and forecasting are making climate health risks invisible in most contexts. This underscores the social, political, and economic understanding of health risks within the climate crisis.

In island states such as the UK, Sri Lanka, and Saint Vincent and the Grenadines, the underdevelopment and poverty contributes to much of the

climate-related health risks. As we explain in Chapter 3, the health policies in the UK marginalise the migrants in the delivery of healthcare. In Sri Lanka and Saint Vincent and the Grenadines, the internal migrants are suffering without proper access to healthcare. Poverty emerges through uneven development and underdevelopment at macro levels, where the poor populations receive inadequate healthcare. This is due to marginalisation that is rooted on social invisibility and contributes to neglect climate-related health risks. Poverty is also connected to political instability and economic vulnerability that increase the invisibility of climate-related health risks, where the health systems are disturbed. These can further push vulnerable and marginalised communities deeper into poverty by factors such as disease outbreaks and displacements.

Due to the climate crisis, in all countries of the world there are disruptions by various natural hazards such as hurricanes, heat waves, droughts, and floods. Climate-related food security and displacement is becoming a challenge for most island states. Climate crisis affects the food insecurity in three different ways: reduced crop yields due to climate change, increased crop losses due to hazards, and decreased nutrient contents due to changed climate. These impacts are devastating the health of individuals and communities in many regions. As far as 2013, the Food and Agriculture Organization of the United Nations (FAO, 2013) projected that climate change will reduce wheat, sorghum, millet, and maize yields in Africa and South Asia by approximately 8% towards 2025. According to the UN Refugee Agency (UNHCR, 2023), only in 2022, climate-induced disasters triggered more than half of the reported displacements, but almost 60% of refugees and internally displaced populations are living in countries that are most vulnerable to climate crisis.

The social, political, cultural, economic, and environmental vulnerabilities are increased by the climate crisis. In this, health becomes a collateral in policymaking, implementation, and prioritisation of resource allocation. What we are arguing is that the nature of hazards is changing due to the climate crisis, and therefore disasters are dominated by extreme climatic events. Policymakers and practitioners need to accept that urban settings themselves are hotspots for disasters that increase their risk as communities are constantly becoming heavily urbanised. The policymakers and implementors, especially healthcare services, need to question their own practices and standards and reconsider whether mainstream model of healthcare is appropriate to deal with climate-related health risks. Above all, there must be a recognition that risks are socially produced in the process of attempting to produce nature.

Island States and Health Risks

According to Britannica (2025b), an island is defined as a landmass smaller than a continent and surrounded by water. Islands may be situated in oceans, seas, lakes, or rivers. Furthermore, the United Nations Convention on the Law of the Sea – Part VIII (UN, 1982) defines an island as a naturally formed

area of land, surrounded by water and remaining above water at high tide. This Convention also clarifies that if there are no human habitat or economic life, then those lands (or rocks) are not considered as islands. Based on these definitions, an island must be a naturally formed land. Their formation must be endogenous through a natural process such as the movement of the earth's crust or tectonic. Human-made renovation or landfilling or avalanches are not necessarily considered islands. Islands are homes to ecological diversity of plants and animal lives. Islands are often rich in ecological diversity, supporting unique plant and animal life. Oceanic islands, in particular, act as natural barriers to species introduction, allowing flora and fauna to evolve in isolation. In contrast, continental islands often share biodiversity with their neighbouring mainland. Depending on the duration of their separation, evolutionary divergence through natural selection can significantly alter the island's biotic communities.

Barnett (2001) highlights the challenges of adapting to climate change in Pacific Island nations, emphasising the problem of uncertainty in climate predictions and policy responses. While increasingly precise, climate models still contain gaps that make long-term adaptation planning complex. Similarly, Barnett and Waters (2016) critique traditional vulnerability frameworks, arguing that SIDS should not merely be seen as passive victims but as active agents in shaping their development trajectories. This perspective is crucial for shifting away from deterministic narratives that portray SIDS as doomed to environmental degradation. Walshe and Stancioff's (2018) work complements this perspective by presenting localised understandings of climate risks and adaptation, underscoring the importance of integrating Indigenous knowledge into policy planning. Indigenous ecological practices, such as traditional water conservation techniques and community-based disaster management, provide valuable insights into resilience-building strategies that are often overlooked in top-down climate governance models.

Baldacchino (2018) challenges the dominant climate-centric discourse by arguing that non-climate-related development issues in SIDS are often overlooked. He advocates for a more holistic approach that considers economic diversification, governance, and social policies alongside climate adaptation. This is particularly relevant given the economic reliance of many SIDS on tourism, remittances, and external aid, making them susceptible to environmental and economic shocks. Hay et al. (2013) further explore this dynamic, demonstrating how global environmental change influences development strategies in small island settings. Petzold and Magnan (2019) extend this discussion by questioning the conventional categorisation of SIDS, arguing for a more nuanced understanding that recognises the heterogeneity among these islands. While many SIDS share common vulnerabilities, their capacities for adaptation differ based on governance structures, economic resources, and social cohesion. This perspective calls for tailored policy interventions that consider these distinctions rather than a one-size-fits-all approach to climate adaptation.

In island states such as Sri Lanka, Saint Vincent and the Grenadines, and the UK, humans have populated them for thousands of years or more. Sri Lanka has been a home for rich social and cultural diversity due to travel of the sailors and merchants for many thousands of years. In the UK, there is historical evidence of people travelling to various parts of the island over many centuries for trade, manufacturing, and invasions. From a European perspective, islands were the target of colonisation, and in the 19th and early 20th centuries, the majority of islands in many parts of the world were under European control. Decolonisation process has resulted in some but not all island states becoming self-governing with lasting effects related to industrialisation, nuclear weapon testing, invasive species, underdevelopment, and tourism. Baldacchino (2007) claims that closer to 10% of the world population at that time – some 600 million people – lives in islands. Further, one-fourth of the sovereign states consist of island states. Islands based on the combined land area and exclusive economic zones take up over one-sixth of the surface of this planet. Disciplines such as biogeography and anthropology emerged through islands due to colonial academic interventions. While important homes for biodiversity, islands in the contemporary world are hotspots for international political tension.

Against this backdrop, island states are among the most vulnerable geographies threatened by the climate crisis. Rising sea levels pose existential threats to countries such as Saint Vincent and the Grenadines, the Maldives, and the Marshall Islands. Increasing frequencies of tropical cyclones, prolonged droughts, and intense flooding result in widespread destruction of both human and animal habitats. Many species endemic to island environments face heightened risks of extinction due to climate-induced changes. In contemporary global platforms, there is an increased attention on small island states, especially the SIDS. According to Thomas et al. (2020), SIDS are a collective of 38 UN member states and 20 non-UN member states or associate members that are located in the Caribbean, the Pacific, and the Atlantic, Indian Ocean, Mediterranean, and South China Seas (AIMS). Although there are many differences, these SIDS share common features such as narrow resource base, nature-based economic sectors, limited industrial activities, physical remoteness, and limited economies of scale. Sea level rise, changes in temperatures and rain, food insecurity, increased health risks, and coastal erosion combined with limited water resources are impacting SIDS due to the climate crisis.

Campbell and Barnett (2010) explore the role of power and knowledge in shaping climate change responses in the Pacific. They critique the dominance of Western scientific frameworks in climate adaptation discourses. This critique is particularly pertinent given the history of colonialism in many SIDS, where external interventions have often sidelined local knowledge and agency. Rudiak-Gould (2013) echoes this concern, highlighting the ways in which traditional ecological knowledge and cultural narratives interact with

scientific understandings of climate change. In many island communities, climate change is seen not only as an environmental issue but also as a spiritual or moral one, influencing how local populations interpret and respond to environmental changes. Recognising these perspectives is essential for creating culturally sensitive adaptation strategies. Oakes (2019) further investigates how climate change influences mobility decisions in Pacific SIDS, revealing the interplay between cultural identity and environmental displacement. Migration is increasingly framed as an adaptation strategy rather than a last resort, with many island communities negotiating complex decisions about relocation while attempting to maintain cultural continuity. This challenges the notion of SIDS inhabitants as passive victims of climate change, instead highlighting their agency in shaping migration outcomes.

Whether referring to a small island such as Saint Vincent and the Grenadines, a larger island state such as Sri Lanka, or a major island nation like the UK, it is increasingly evident that island territories are on the front line of climate change impacts. In this book, we are attempting to connect climate change, disasters, and health risks in the context of island states due to their historical, geographical, social, political, economic, cultural, and environmental conditions.

Rodney (1973) and Shiva (1991) provide foundational critiques of underdevelopment's historical and structural dimensions, which remain relevant to contemporary discussions on climate change in SIDS. Rodney's analysis of colonial underdevelopment offers insights into the enduring economic vulnerabilities of small island nations, while Shiva's critique of the Green Revolution highlights the ecological consequences of externally imposed development models. These perspectives are crucial for understanding how historical inequalities continue to shape contemporary climate vulnerabilities. Nurse et al. (2001) build on these perspectives by examining the compounded vulnerabilities of SIDS in the context of global climate change policies. They argue that global climate negotiations often fail to prioritise the needs of small island nations despite their disproportionate exposure to climate risks. This highlights the importance of stronger representation for SIDS in international climate governance mechanisms. Regardless of the human population, the island ecosystems and biodiversity are much more important to this planet. For example, the island plants and vertebrates occur on less than 5% of the surface of the Earth, and they have an endemic richness that may exceed that of mainland species by a factor of 9.5 (Kier et al., 2009). Due to the climate crisis, the sea levels rise, and the shift in temperature and rainfall can change the plants and animals of islands, which can impact natural processes globally. The possible collapse of deep and long branches in vulnerable islands would lead to relatively low absolute loss of plant phylogenetic diversity (Veron et al., 2019). Phylogenetic diversity is a measure of biodiversity that incorporates phylogenetic differences between species. According to Britannica (2025c), phylogenetics is referred to as the study of the ancestral relatedness

of groups of organisms, whether alive or extinct. It is important because it enhances the human understanding of how genes, genomes, and species evolve. In essence, what we are pointing towards is that island ecosystems and biodiversity are essential to human existence on this planet. It is important to remind that human population is dependent on nature and natural processes and not the other way around.

Connecting the Ideas

It is beyond dispute that the Earth is undergoing profound and accelerating climate change, driven largely by the failure of human societies to coexist harmoniously. Throughout the Earth's history, the climate has changed several times, however, stretched over very long periods. Unfortunately, due to human activities such as uneven development and biological invasion, the current changes to the climate are taking place over the space of a century or less (Parmesan and Yohe, 2003). On this backdrop, connecting climate change, disasters, and health risks in the context of island states is not necessarily a challenge. But why examine the UK, Sri Lanka, and Saint Vincent and the Grenadines together? Beyond the geographical commonality that they are all island territories, their historical entanglements provide compelling grounds for comparison.

From a historical standpoint, the UK was the epicentre of the British Empire – one of the most expansive and extractive imperial projects in modern history. Revisionist accounts, such as *Ferguson's Empire: How Britain Made the Modern World* (2012) and Gilley's *The Last Imperialist* (2021), have attempted to frame British colonialism as a civilising force that brought infrastructure and prosperity to colonised regions. Yet this narrative collapses under the weight of critical historical scholarship and the lived experiences of colonised peoples. In the Indian subcontinent alone, it has been estimated that British imperial policies contributed to the deaths of over 100 million people between 1881 and 1920 (Sullivan and Hickel, 2023). Instead of going into the details of the impact of the British Empire, we conclude the historical details from the fact that both Sri Lanka and Saint Vincent and the Grenadines experienced social, political, cultural, economic, and environmental destruction of the evolution of institutions, systems, and epistemologies by the British Empire. Both the islands continue with a colonial legacy of political structures, education, and healthcare systems.

Curiously, while the British Empire has been extensively studied in relation to its former colonies, considerably less attention has been paid to the impact of imperialism within the metropole itself. Contemporary discourse in the UK remains largely disengaged from the empire's domestic legacy. Among the general public, the British Empire is often imagined as a distant phenomenon, geographically and temporally removed from the British Isles. Yet the internal dynamics of British society during the imperial period reveal a parallel logic

of dispossession and dehumanisation. The poor in Britain were subjected to forms of governance and neglect not dissimilar to those experienced by colonial subjects. In *The Wealth of Nations* (1776), Adam Smith suggested that poverty and hunger could function as population control mechanisms, a sentiment that speaks volumes about the prevailing attitudes towards the working classes in industrial Britain. Charles Dickens, the English novelist, journalist, and social critic in his novel Oliver Twist (1838) writes about child labour, domestic violence, the recruitment of children as criminals, and the presence of street children in poverty-stricken UK. The residual structures of the empire are still evident today. The London School of Hygiene and Tropical Medicine (LSHTM) and the Liverpool School of Tropical Medicine (LSTM) – two institutions central to contemporary global health education – are situated in former slave port cities and were established, in part, to facilitate the colonial administration of health across the British Empire. These institutions were not neutral scientific enterprises; rather, they were instrumental in consolidating imperial authority through the strategic deployment of medicine as a tool of governance (Hirsch and Martin, 2022).

During the height of the empire, LSHTM and LSTM were at the forefront of constructing and marketing the notion of "the tropics" as a distinct geographical and pathological space – exotic, dangerous, and in need of scientific control. Tropical medicine emerged not as a disinterested field of enquiry but as a disciplinary apparatus aligned with colonial objectives, designed to protect imperial personnel and optimise the health of labour forces in plantation economies and extractive industries. Through medical research, training, and public health interventions, these institutions established a hegemonic position in the production of knowledge about the Global South, effectively rendering the colonised populations as subjects of study rather than co-producers of knowledge. The epistemological frameworks developed by LSHTM and LSTM did more than address the disease; they served to legitimise the imperial civilising mission by framing health interventions as benevolent and necessary, masking the exploitative economic and political structures upon which colonialism depended. In doing so, these institutions entrenched a form of biomedical dominance that persists in contemporary global health, where hierarchical North–South relationships continue to define research agendas, funding flows, and modes of knowledge validation. The legacy of this medical imperialism thus remains embedded not only in institutional histories but also in the very conceptual architecture of global health.

In this context, it is necessary to critically examine the concept of the Commonwealth, particularly given that both Sri Lanka and Saint Vincent and the Grenadines remain members of the Commonwealth Association. The term "Commonwealth" has been widely used since the 1949 London Declaration, which formally established the British Commonwealth of Nations, to describe the network of relationships among states formerly under British imperial rule. According to Britannica (2025a), the Commonwealth Association

presents itself as a voluntary association of sovereign states, including the UK and many of its former colonies, bound together by ties of friendship, shared values, and practical cooperation, with the British monarch symbolically recognised as its ceremonial head. However, scholars such as Chambers and Gilmour (2024) argue that the real problem of the idea of commonwealth is that it denies the colonial violence, plunder, and destruction under the British Empire. This problem also includes the way the former colonies were mutated within their social, political, cultural, economic, and environmental evolution that shapes the contemporary world. Against this backdrop, this book seeks to examine the interrelated dynamics of climate change, disaster, and health risks in the UK, Sri Lanka, and Saint Vincent and the Grenadines. These case studies are not merely connected by their shared insular geographies but by their entangled colonial pasts and their ongoing involvement in the post-imperial framework of the Commonwealth – an association that continues to influence global hierarchies in both subtle and explicit ways.

Conclusion

The relationship between climate change, disasters, and health risks in island states presents a profound and significant challenge for the global community. As this chapter has demonstrated, the impacts of climate change are not merely environmental but are deeply intertwined with social, cultural, economic, and political dimensions. Rising sea levels, extreme weather events, and shifting ecological patterns are not abstract future threats but present realities that exacerbate vulnerabilities, particularly among the poor and marginalised. The case studies from the UK, Sri Lanka, and St Vincent and the Grenadines reveal that while the manifestations of these challenges may differ, the underlying thread of inequality and uneven development remains a constant. Poverty, as a structural determinant of vulnerability, amplifies the health risks associated with climate change and disasters, leaving those with the least resources to bear the heaviest burdens. Moreover, the sociocultural dimensions of climate change and disaster responses cannot be overlooked. The philosophical misunderstandings in the UK, the overlooked traditional knowledge in Sri Lanka, and the community-driven resilience strategies in St Vincent and the Grenadines all highlight the critical role of local perspectives in shaping effective and equitable responses. Yet the prevailing tendency to prioritise expert-driven, top-down approaches often sidelines the voices of those most affected. This disconnect not only perpetuates inequalities but also undermines the potential for inclusive and sustainable solutions.

Addressing these disparities requires a paradigm shift towards inclusive, decolonial, and community-led adaptation strategies. Integrating Indigenous ecological knowledge with scientific frameworks can foster more contextually relevant and sustainable solutions. Moreover, equitable governance structures must be strengthened to ensure that SIDS have a significant voice

in international climate negotiations. Future research should further explore the intersections of climate adaptation, economic resilience, and post-colonial governance, particularly in relation to migration and health systems. Climate justice can be achieved for these vulnerable yet resourceful island states only through a more inclusive and decolonial approach.

Climate policies must adopt an interdisciplinary approach that combines ecological science, sociopolitical analysis, and Indigenous knowledge, recognising the historical injustices that have shaped vulnerabilities in SIDS. For many Commonwealth nations in the Global South, legacies of colonialism have left governance structures, economic dependencies, and environmental policies that continue to undermine resilience. Thus, equitable governance structures must be strengthened to ensure that SIDS have a significant voice in international climate negotiations, advocating for reparative climate financing and sustainable development pathways tailored to their specific needs. Future research should explore the intersections of climate adaptation, economic resilience, and post-colonial governance, particularly in relation to migration, health systems, and the structural inequalities embedded in global economic frameworks. Climate justice can be achieved only through a more inclusive, historically aware, and decolonial approach for these vulnerable yet resourceful island states.

We want to emphasise that this book is not to instigate hatred against the historical events through the British Empire. What we want to examine is that three islands that are connected through the British Empire are dealing with climate change, disasters, and health risks in shared historical as well as different yet similar social, political, cultural, economic, and environmental contexts. We invite the readers to critically engage with the individual chapters, especially on the UK, Sri Lanka, and Saint Vincent and the Grenadines to compare the challenges of climate change, disasters, and health risks in island states. To remind that the UK claim to be a developed island while there are many social, political, and economic challenges with less attention to climate-related problems. Sri Lanka is going through a deep economic and financial crisis without much attention to climate change or disasters or health risks. Saint Vincent and the Grenadine is experiencing destructive disasters due to climate change resulting in increased the health risks.

Finally, we want to highlight that human populations must function according to nature and natural process. This is not an ideological claim but a humble request for survival. If we – human beings – want to survive on this planet, we need to seriously rethink, reevaluate, and reshape our social, political, cultural, economic, and environmental systems. The three case examples we are providing to remind the readers that no matter what status an individual country is functioning, without collective action, we will perish. We are on the same ship and in different cabins as individual countries. One cannot claim that their individual cabin is doing fine because if even a single cabin is leaking, the ship will sink!

Note

1 Throughout this book, we use terms such as nature and natural processes as governing systems of this planet. Environment in this context is created and built by the humans for social, economic, political, and cultural purposes. Nature sits above human populations and their activities.

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3 Rethinking Du Bois's 'Colour Line'

Climate Change, Environmental Racism and Health in the United Kingdom

Karl Atkin

The health risks associated with climate change will impact on Great Britain, and although the context is different, some of these challenges are similar to those facing other island states. Increasing incidents of extreme and unpredictable weather create short-term risks associated with loss of life and damage to the infrastructure. More long-term responses require becoming less dependent on fossil fuels, altering consumption habits, responding to urbanisation, managing rural habitats (including floodplains) and developing sustainable agricultural practices to maintain food security (Klein, 2015). Responding to the challenges requires a political, economic, social and cultural preparedness. Health is an important part of this (Friel, 2019). The sensitive balance between health and the environment in which it is realised is well established, meaning any changes in the relationship is likely to impact on morbidity and mortality (McMichael, 2017). Disruptions to protective aspects of health, caused by climate change, such as living conditions, employment, education, health and social care provision, when combined with possible threats to water supply, effective sanitation and food production, create a threat to well-being. More immediate – and direct – concerns include how climate change may alter the conditions in which viral and bacterial infections can thrive, which will necessitate a rethinking of how island states respond to infectious disease, alongside making the consequences of non-communicable diseases more difficult to manage and negotiate.

Britain is better placed than most islands, particularly those in the Global South, to mitigate these risks. It is less exposed to the extremes of climate change, when compared to Africa, Americas and Southeast Asia. As a high-income country, it also has access to resources to enable it to invest in protective measures, such as a supportive and adaptable infrastructure. Britain has a well-established and publicly funded healthcare system and currently enjoys effective sanitation strategies, including access to clean drinking water and disposal of sewage. Much – of course – depends on a political willingness to safeguard Britain against the effects of climate change, as the continual

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contamination of water sources with sewage and the more general breakdown of infrastructure, following storm damage, demonstrate.[1] The challenges facing the NHS are also well documented (OECD, 2023), while the persistent impact of inequalities is likely to find expression when preparing for the impact of climate change, (see Wilkinson and Pickett, 2018), including those generated through racist practice (Bhambra and Newell, 2023).

Britain, however, is responsible not only for managing the consequences of climate change within its own boundaries. Its global relationships (and influence) mean its activities impact on the rest of the world, with racism once again an important influence. These relationships – historically located and associated with the legacies of post-colonialism – threaten social justice and equity (see Andrews, 2022). They explain how middle- and low-income countries remain more exposed to the impact of climate change, when compared to the Global North (WHO, 2023), although this may not always be recognised by Britain's citizens, who underestimate consequences of climate change for Black, Arab and Asian populations (Christian Aid, 2020).

Exploring the potential inequities created by climate change within Britain and those generated by its global relationships, is the starting point of the chapter. First, it investigates the challenges Britain faces when managing the health risks associated with climate change through the lens of racial inequality. Second, the chapter explores how Britain's activities – as a globally connected, consumer-orientated economy whose initial industrialisation had lasting environmental consequences – impact on the health risks associated with climate change found in other countries. In connecting these two themes, the chapter begins by introducing the conceptual importance (and continuation) of what Du Bois described as the 'colour line', in which intersectional social relationships produce and reinforce racist outcomes. The sensitivity of Du Bois's work, when providing meaning to a global intersectional racism and whose analysis provides the opportunity for a more inclusive future free from discrimination, offers an ideal framework with which to understand the inequalities generated by climate change.

Colour Line

Du Bois was among the first sociologists to recognise the extent socially constructed accounts – as products of human definition and shaped by cultural and historical contexts – reinforce power relationships to create racism (see Morris, 2015). Also, he established the importance of generating a conceptual and critically engaged understanding of intersectional and global social relationships (Itzigsohn and Brown, 2020). Du Bois is perhaps best known for the "colour line", which he initially used to explain the racist injustices in the USA, associated with the "separate but equal doctrine" (see Du Bois, 1899, 1903) before adapting it to explore global racist practices (see Du Bois, 1952). Fredrick Douglass (1881) spoke of a "colour line" to describe the continued

racism and segregation accompanying the abolition of slavery in the USA (see Morris, 2015). Repurposing the theme, by providing it with dialectical intent, Du Bois (1903) identified the "colour-line" as the major problem of the twentieth century, in which social relationships and practices, underpinned by an ideological justification that makes racism difficult to identify and challenge, create a "veil" to reinforce discriminatory practices (see Rabaka, 2021).

Du Bois theorised how racialised subjectivities emerge within normative systems that position marginalised groups as inferior "others" requiring civilised management (Meer, 2022; Meghji, 2020). This epistemic framework naturalises inequality while obscuring its constructed origins (Rabaka, 2021). His concept of double consciousness (Du Bois, 1903, pp. 10–11) captures the dehumanising effect of internalising external gazes that frame Black existence as inherently problematic. While this internalisation constrains agency by reinforcing racialised expectations (Itzigsohn and Brown, 2015), Du Bois identified its critical potential. The outsider-insight generated through double consciousness enables marginalised groups to decode power structures invisible to dominant groups (Hughey, 2021). This epistemic privilege fosters the dissatisfaction necessary for transformative struggle – the moral imperative to "cross the colour line" (Du Bois, 1903).

Du Bios (1898), when using the colour line to challenge racism, remained sensitive to how unfavourable comparisons with the practices of a dominant (white) group, by enforcing their superiority, connects difference with a moral hazard that threatens the social order (see also Fanon, 1961). Inclusive approaches remain rare, while reductionist and essentialised accounts, insufficiently responsive to testimonial experience, are commonplace (Hall, 1996). Agency is denied, and different ways of thinking are disregarded. Not all lives have the same value. Prioritising ways of living and deciding those that can be sacrificed is an outcome of political and social power (see Mbembe, 2019). Making sense of these epistemic and material challenges, however, obliges us to offer a convincing account of experience, without sacrificing subject-freedom to the inevitable outcome of social (and historical) relationships (see Gilroy, 2004). This requires us to "ask better questions" (Fassin and Das, 2021), where consequences define our understanding of difference as much as circumstance (Du Bois, 1920). The ongoing significance of the colour line in the twenty-first century is a reminder of a racist past that persists in colonising the present by placing a moral value on life (see Táíwò, 2023). Du Bois conceptualised racism as generating an "afflictive gaze" that reconfigures cultural difference into hierarchical divisions, reinforced through structural inequalities (Du Bois, 1903). This process simultaneously enacts epistemic violence by constraining future imaginaries and agency (Du Bois, 1920). Resistance, he argued, emerges through rupturing this temporal continuity between oppressive present and predetermined futures (Du Bois, 1897). His vision of cultural democracy – distinct from formal political systems – demanded genuine pluralism where difference

generates transformative potential rather than exclusion (Du Bois, 1945). Different ways of thinking, by becoming valued, create an entanglement able to challenge current practice, in which the transformative power of individual (and collective) subjectivities is empowered.

The Colour Line and COVID-19

Before exploring the implications of Du Bois's reasoning for how we recognise and challenge the health risks created by climate change, a more recent example offers a reminder of how the colour line remains a feature of global health. The impact of climate change is likely to reproduce this. The COVID-19 pandemic re-established familiar fault lines when understanding racism within state boundaries and through the risks generated by global relationships (see García and Sharif, 2015). Outcomes reflected this, along with explanations of how racial differences mediated experience (Sandset, 2021). The focus shifted from an initial reluctance to acknowledge the possibility of inequalities, on the basis that viruses do not discriminate, to explanations that misrepresented experience by essentialising cultural practices and using them to account for differences (see Andrews, 2022). Racial and ethnic minorities, irrespective of global locality, experienced a disproportionate number of infections and more severe complications and higher mortality than majority (white) groups (see Reyes, 2020; and for a global perspective see Touchton et al., 2021). In England and Wales, for example, men identifying as Black were four times more likely to die from COVID infection than their White counterparts (Office for National Statistics, 2020). A similar pattern emerged in the USA among African American men (see Andrews, 2022) and among minority groups living in Brazil (Touchton et al., 2021). State-sponsored explanations located the "problem" within cultural and social behaviours by emphasising the risk created by large communal households, an inability to understand the value of vaccination, unsafe community practices and unhealthy habits (see Commission on Race and Ethnic Disparities, 2021 for a discussion of the UK experience). This disregarded a racism which by generating poverty, creating poor underlying health, impacting on employment patterns (including over-representation among key workers) and mediating access to appropriate healthcare increased COVID risk (see Public Health England, 2020).

The long-standing practice of attributing structural problems to marginalised groups' behaviours (Kipple and King, 1981) reflects Du Bois's 'double gaze' – where systemic failures are individualised. During COVID-19, this manifested through:

1) Cultural stereotyping that blamed ethnic minorities' family structures for infection rates while ignoring socio-economic determinants (Atkin et al., 2023)

2) Global vaccine apartheid, with <9% African vaccination rates versus the WHO's 40% target (WHO, 2023)

The pandemic exposed how underfunded health infrastructures in LMICs – a legacy of colonial underdevelopment (Mills, 2014) – exacerbated catastrophic outcomes (6.1 million excess Southeast Asian deaths). As WHO (2023, p. 14) notes, such crises reveal "inequality in health emergency preparedness" requiring urgent international redress.

The (Potential) Impact of the Colour Line in Britain

Racial inequalities have a long-standing significance when explaining health outcomes in Britain (see Chattoo et al., 2019). A recent example demonstrates the systemic nature of structural racism and one of particular relevance for UN Sustainable Development Goals. In England, 3,743 children (under 18 years of age) died in 2022/2023 (National Child Mortality Data Base, 2023). Mortality was highest among children of Black or Black British ethnicity and/or those living in the poorest areas. Mortality rates for those living in the poorest areas, for example, were twice as high as the richest areas. Ethnic origin, however, further compounded these social inequalities. The average English death rate was 31.8 per 100,000 children under five years old, although for those of Black or Black British ethnicity it stood at 56.6, and for children of Asian and Asian British ethnicity the figure was 50.8. For children recorded as having white ethnicity, the figure was 25.5. The mortality rate of those under one year of age showed similar disparities. The average mortality rate of 3.8 per 100,000 births increased to 5.4 for those living in the poorest areas; 8.7 for those identified Black or Black British (nearly three times that of the infants of a White ethnicity) and 6.2 for those of Asian/Asian British ethnicity. Rising inequalities is provided as an explanation, of which racism plays an important and familiar role, which by preventing access to appropriate care and generating material disadvantages creates the conditions for ill health among children, along with a lack of resources able to mitigate its impact (see Karlsen et al., 2019).

The colour line is, therefore, likely to be a continual presence in any preparedness for climate change. Racialised minorities living in Great Britain not only experience greater material inequality but also become responsible for their own vulnerability, as a consequence of their cultural practices (Chattoo and Atkin, 2019). There is no reason to suppose that understanding about the impact of climate change will be different. Difference is either ignored or when acknowledged, mispresented. As Kipple and King (1981) observe, minorities suffer once, because of their health problems and then, because their health problems are turned against them. Employment, income, housing and education have an important protective effect on health, as does accessibility to appropriate health and social care. While material security, access to

social support, social capital and social cohesion become important considerations when maintaining health equity, as is the fair distribution of power, money and resources (see Friel, 2019). A person's ethnic origin is an important mediating and explanatory variable when understanding the health disparities generated by an unequal access to opportunities (Chattoo and Atkin, 2019).

It would seem reasonable to assume that any impact of climate change is likely to be socially patterned, with exposure and experience mediated by one's social position. Hospital admissions and increases in mortality and morbidity are associated with prolonged periods of hot weather, above 30 degrees Celsius (McMichael, 2017). This disproportionately affects older people and those with underlying health conditions, which have a higher incidence among racialised minorities, who also have less access to material and social resources to lessen its impact (Klein, 2015). Poor air quality raises similar challenges to morbidity and mortality. It is associated with localities which have a higher proportion of lower social-economic groupings and racialised minorities (see Williams, 2021). Access to a supportive built environment (including access to amenities and green spaces, able to offer shade) and suitable housing able to mitigate the impact of climate change are also socially patterned and have the potential to generate further disadvantage, as do employment patterns. COVID-19 reminded us that certain occupational groupings, associated with minority status, experienced greater disruption than others. Those on precarious contracts faced particular challenges, including a risk to their income, while those in front-line occupations risked greater exposure to ill health. Other emerging consequences concern the (existential) anxiety created by climate change, which is beginning to affect mental health (Brossard and Chandler, 2022). This is in addition to the impact on mental health created by the immediate disruptions generated by climate change (see Klein, 2014). Access to appropriate mental health support, however, remains a site of racist practice (Keating, 2019).

The experiences of Gypsy, Traveller and Roma communities offer an important example of the relationship between the colour line and environmental racism. Housing stock and accommodation present particular challenges. Public sites, often situated in undesirable locales, such as on urban fringes and close to industrial areas or major roads, increase the risk of environmental pollutants and poor air quality (see Williams, 2021). Caravan-based accommodation has limited capacity to withstand extremes in temperature; while those living in more traditional housing stock identify poor quality accommodation in undesirable locations with little supportive infrastructure (Friends, Families and Travellers' Report, 2022). Access to appropriate health and social care demonstrates similar patterns of inequality, with a lack of trust identified as a specific problem (McFadden et al., 2018). The needs of traveller and gypsy communities are also accorded little priority by local authorities and central government (House of Commons Report, 2019). This helps explain higher rates of chronic conditions and poorer health outcomes,

reduced life expectancy, increased maternal and infant mortality (morbidity), when compared to the general population of Britain (McFadden et al., 2018; House of Commons Report, 2019). Employment patterns present additional challenges. Precarious employment, often outdoors, generates particular risk, as climate change is likely to disrupt income-generating opportunities. The protective impact of employment on health is, therefore, broken, creating further risks to wellbeing. Rather than offering explanations, consistent with structural disadvantage, problems become located within the community, who often find themselves criticised for their failure to integrate, for living unconventional lifestyles, their poor health literacy, failure to understand how healthcare agencies operate and their preference to look after their own (see McFadden et al., 2018). Difference, therefore, creates a problem to be solved, in which lives become associated with the "other" and accorded a lesser moral value (Friends, Families and Travellers, 2022).

Recent initiatives in understanding global health, which speak of socially transmitted (rather than communicable or non-communicable) diseases, are of particular relevance to understanding the lives of racialised minorities living in Great Britain (see Allen and Feigl, 2017). Poor health is generated through exposure to social conditions, which, as Du Bois reminds us, become projected forward, unless challenged. Climate change and the potential for environmental racism represent an important part of this settlement, as is the need for an intersectional approach that reflects the complexity of interrelationships between economic activity, systemic environmental impacts and existing inequalities (McMichael, 2017). As Du Bois observed, however institutional racism is no respecter of national boundaries and Britain's global footprint, as a function of this complexity, enables it to generate inequalities beyond its shores, including that of other island states. This is historically (and epistemically) located while generating material outcomes.

Global Relationships and the Colour Line

Before understanding the consequences of the colour line, it is important to discuss the episteme that supports it in which Europe became a "culture like no other", by ensuring other cultures, "existed only through and in relation to it" (Mbembe, 2019, p. 121). Universalism was used to disguise exceptionalism and alternative explanations disregarded. As Du Bois understood, racism requires an ideological justification, which normalises inequality while making it difficult to challenge. This episteme provides an explanation for racist practice in Britain. Also, it is projected globally. Enlightenment values, by establishing universal ideas of fraternity, liberty, equality, life and the pursuit of happiness, became the organisational principles of a modernity that prioritised individual subjectivities, use of reason, equality before law and consensual government (see Táíwò, 2023). Some, however, became more equal than others. The need to exploit raw materials to generate wealth required

a demonised "savage" morally and intellectually inferior to a European civilisation that needed to triumph for the betterment of a universal humanity (see Fanon, 1961). This racialised modernity justified the unjustifiable: subjugation of the people living in other nations through genocide, slavery and colonisation. Despite an apparent universal commitment to equality, the Enlightenment generated an exceptionalism that excluded some 'races' from such aspirations. Du Bois (1935), for example, identified a moral disjunction that proclaimed the equality of men and established a form of government on the basis of their consent, yet excluded slaves (and see James, 1938, for an example of how attempts to establish a Republic, "free from the aristocracy of skin", failed because it could not overcome a racial hierarchy, which maintained the superiority of 'White' culture). In support of Du Bois, a delegation from the Qing dynasty, when visiting the USA, to learn more about Western democracy, became confused by how explicit racist exclusion occurred, without any commentary on its obvious contradiction to the founding principles of the nation (Fairbank, 1986).

The death of millions of people in the Americas and Africa did not raise any particular moral commentary but is seen as an inevitable consequence of the civilising aspects of colonisation (Walvin, 2022). The destruction of populations and environments remained an important feature of this colonisation (Crook and Short, 2014). While difficult to estimate, it is suggested that prior to colonisation, the population of the Americas was 72 million. One hundred years later it was 4.2 million (Andrews, 2022). Recent writings have also located the origins of the current climate crisis to the devastation of the America's natural environment for colonial exploitation (McMichael, 2017). Exploitation and destruction continued into the nineteenth and twentieth centuries, with examples including Tanzania and Congo, where colonisers killed a considerable proportion of the population, extracting resources for profit which caused considerable environmental damage (Frankopan, 2023). This, as part of a more general process, meant that countries such as India and Ireland continued to export food stuffs while experiencing famines that killed significant proportions of their population (McMichael, 2017).

Colonial exploitation was fundamentally driven by extractive economics that disregarded both human and environmental costs (Andrews, 2022). Britain's eventual opposition to slavery reflected economic pragmatism rather than moral awakening – its abolitionist stance sought to undermine rival European powers that had benefitted from British-dominated slave markets (James, 1938). The 1833 slave-owner compensation scheme created a national debt only fully repaid in 2017, effectively forcing descendants of enslaved people to subsidise their oppressors (Andrews, 2022). Similar patterns of economic coercion emerged in post-revolutionary Haiti, where crippling reparations demands stunted development for generations (Hazareesingh, 2021). These systems required ideological justification, which Enlightenment thinkers like Kant and Hegel provided through pseudoscientific racial

hierarchies that positioned non-Europeans as intellectually and emotionally inferior (Andrews, 2022; Gates, 2019). Du Bois (1903) challenged these biological determinist fallacies, demonstrating their social construction. Yet such theories had devastating real-world consequences: from the "one-drop rule" underpinning US segregation (Gates, 2019) to the Nuremberg Laws' racial classifications enabling the Holocaust (Arendt, 1963). As Andrews (2022, p. 40) notes, this represented "the logic of empire brought into the heart of Europe", mirrored in Australia's assimilation policies targeting Indigenous communities (Batrop, 2009). These intersecting cases reveal how racial capitalism operationalised supposed scientific racism across imperial contexts. The abandonment of racial categories, following a holocaust, which led to the wholesale destruction of European Jewry, along with other 'undesirable' groups, such as Roma, did not prevent the operation of the colour line. This is despite the introduction of "ethnicity" by the United Nations Educational, Scientific and Cultural Organisation in 1950 as a counter to racist categorisation.[2]

The shift from biological race to cultural ethnicity did not dismantle racial hierarchies but reconfigured them as cultural racism, maintaining the logic of difference while obscuring structural power imbalances (Byrne, 2006; Andrews, 2022). This is exemplified by the framing of global aid, which often attributes disparities to ethnic or cultural factors rather than colonial legacies – such as the $1.75 trillion net resource transfer out of Africa (1995–2019) (Andrews, 2022).

Western exceptionalism further marginalised non-European knowledge systems. For instance, eighteenth-century smallpox inoculation, initially dismissed despite its colonial origins, was later appropriated without acknowledgement (Carrell, 2004). Similarly, British-imposed mechanised farming in Kenya disrupted sustainable local practices, degrading soil fertility and reducing yields – a pattern emblematic of colonial extraction that prioritised Western profit over local development (Rodney, 1979). Such policies systematically undermined infrastructure, education and self-sufficiency, exacerbating post-colonial vulnerabilities to climate change and health inequities. Rodney (1979) reframed 'underdevelopment' as a consequence of Western overdevelopment, where growth eclipsed sustainability. This aligns with Sen's (1981) critique of capability deprivation and challenges Western substantivism, which reduces nature to an exploitable resource (Meghji, 2020). Together, these critiques reveal how epistemic dominance perpetuates ecological and social injustice.

The Impact of Climate Change on Global Health

The colour line continues to be maintained through global connectedness. Britain – as part of this connectedness – occupies a position of privilege and culpability. Global inequalities, as indicated by the Gini Coefficient, remain high in Africa and South-East Asia (World Bank, 2022), while the quality of

healthcare provision demonstrates similar disadvantages (Healthcare Access and Quality Collaborators, 2017). Differences between high- and low-income countries is currently 35 years (average life expectancy is 87 years old for women living in Japan, compared to 51 years old for women in Sierra Leone). Low-to-middle-income countries continue to experience high rates of communicable (infectious) diseases, with over 90 per cent of malaria deaths occurring in Africa, particularly among children under five years of age. Africa and South-East Asia also have higher rates of mortality due to diarrhoea-related diseases, which are associated with poverty, poor-housing, undernutrition and contaminated food.

Climate change exacerbates existing health inequalities through enduring colonial power structures (WHO, 2023; Bhambra and Newell, 2023). Neoliberal markets perpetuate these dynamics, prioritising Global North capital accumulation over ecological sustainability (Meghji, 2020; Rodney, 1979). Africa exemplifies this injustice: warming 1.5 times faster than the global average, it faces escalating droughts, disease migration, and climate-induced displacement despite minimal historical responsibility (Williams, 2021; McMichael, 2017; Friel, 2019). Quantitative disparities underscore this inequity. The Global North (USA: 40%; EU/UK: 29%) bears overwhelming responsibility for cumulative emissions compared to the Global South (8%) (Hickel, 2020). Per capita emissions reveal stark contrasts: the USA – 6 metric tons and Western Europe – 2–5 metric tons, dwarf low-income nations – 0.2–0.6 metric tons (Patz et al., 2007). Consequently, Africa suffers 80–120 million climate-related deaths (1950–2000) versus 2 million in Europe/North America, despite negligible emissions (Patz et al., 2007, p. 397). The Global Climate Index confirms this paradox, ranking low-emission African and South Asian nations as most vulnerable to disasters (Williams, 2021; WHO, 2023).

As Shue (1992, p. 389) argues, imposing survival sacrifices on the global poor while affluent nations maintain luxury constitutes profound ethical failure. This "involuntary exposure" (Patz et al., 2007) epitomises what may be modernity's gravest health inequity. The Global Climate Index, which ranks countries most affected by climate disasters, is disproportionately represented by countries in Africa and South Asia, (such as Kenya, Madagascar, Pakistan and Bangladesh and Thailand), which also tend to be those countries with low carbon emissions (Williams, 2021). WHO (2023) confirms this relationship, with regions or populations already experiencing the greater increase in disease and ill health attributable to temperature rise over the past 30 years least responsible for causing global warming.

Climate change disproportionately harms vulnerable groups – particularly children (88% of climate-related disease burden), women, older people and those with disabilities or pre-existing conditions in low-income countries (WHO, 2023; Friel, 2019). Gendered economic disparities and care burdens exacerbate these impacts (Williams, 2021), while affluent nations like Britain sustain overconsumption patterns that deepen global inequities (Wynter, 2003,

p. 260). Friel's (2019, p. 57) 'consumptagenic system' theorises this vicious cycle: fossil fuel-driven growth prioritises polluting production, externalising health and environmental costs onto marginalised populations. This structural violence – where 20% of the world consumes 80% of resources – perpetuates what Wynter termed 'immiseration' for billions.

The globalised market economy characterised by dependence on fossil fuel and pursuit of growth, which is (mistakenly) associated with progress and (excessive) consumption, drives demand, with little regard for the impact of climate change and social inequity (Friel, 2019). Food production (and security) offers, an example, which as we have seen also has a historical precedent. The need to produce cash crops for global markers creates food insecurity for local populations, while the need to package and distribute the food increases the risks associated with climate change, which create the conditions for further food insecurity (Klein, 2017). Global distribution rather than local use contributes to greenhouse gases, while some African states struggle to feed their population, yet have no alternative to export food through the operation of global markets (see Williams, 2021). The role of large multinational corporations reinforces the value of cheap food to benefit (global) consumers rather than incentives for farmers to maintain long-term (and local) sustainability (Friel, 2019). Disruption to local agricultural practices, reduced biodiversity and degradation through land clearing, deforestation and consumption of water occur (Klein, 2015). Additional health risks are created through the use of chemical fertilisers and antibiotics, which infect water courses and contribute to food contamination (Wallace-Wells, 2019). Ground clearing also creates ideal environments for vector-borne diseases, such as malaria (McMichael, 2017).

The prioritising of Western consumption, disaggregated from production, creates other preserve incentives, associated with a focus on personal lifestyle choices, consistent with an entrepreneurial self and neoliberal individualism (see Zizek, 2009). This misses the connectivity of global relationships. Personal efforts to reduce one's personal carbon footprint, although no bad thing, can have consequences, which undermine positive intent, as they continue to be realised within exploitative global relationships. Enthusiasm for biofuels, despite their value, disrupts farming patterns in low- and middle-income countries, by creating competition for land, increasing rental values, and prioritising cash crops for export. This not only generates pressure on local food production but increases its cost (see Friel, 2019). Demand created by electric vehicles raises similar problems. Electric vehicles have the potential to reduce carbon emissions, especially in the Global North. The batteries, however, require the mining of lithium, which causes considerable environmental damage. This explains why indigenous peoples of America, led by women, are protesting against such mines, while in the Demographic Republic of Congo, the employment conditions of the miners and the conditions in which they work have raised concerns about the impact on their health and wellbeing

(Klein, 2015).[3] Plant-based diet and non-dairy alternatives, while also having benefits for reducing the carbon footprint of the Global North, have a familiar impact on farming practices and local labour markets by encouraging the growing of cash crops for export rather than sustainable crops for local need (Klein, 2015). The solution is not necessarily to prevent such initiatives but ensure they are developed with a regard for social justice and equity. These requires alternative thinking.

Alternative Approaches

As mentioned, one of the fault lines of Western epistemes is a disregard for alternative forms of insight and knowledge. Within the context of the current climate crisis, this includes not listening to those experiencing the destruction of their local environments or learning from a wisdom, which seeks not to violate the earth but recognises the limits of exploitation (see Frankopan, 2023). Understanding ethnic (and cultural) identities as a continual response to their environment offers the possibility of generating alternative epistemic opportunities. Aligning a greater understanding of universal collectivity and global multicultural relationships with the value of living on the dividends of the planet rather than its capital enables these alternative approaches to find voice (see Friel, 2019). It no longer becomes possible to see humans as independent of their environment and ideas such as harmony, balance and mutual coexistence assume hegemonic priority.

As demonstrated, the risks created by climate change to human health (and the natural environment) are complex, dynamic and interconnected. Ancient societies understood this (see Nandakumar, 1971) and demonstrate the potential of different world views. For Zoroastrians, nature was regarded as a source of joy but required protection against the destructive habits of human behaviour (Nigosian, 1993). The focus on goodness and purity meant, for example, that Persian societies understood the importance of not polluting water sources (Foltz and Saadi nejad, 2007). Deforestation, a particular concern in South-East Asia, was connected with maintaining benign climate conditions, necessary to ensure harvests and an adequate water supply (Frankopan, 2023). In 524 BCE, Duke Mu of Shan (an official at the Zhou Court) warned about the dangers of cutting down forests, otherwise, "the forces of the people will be weakened" (Frankopan, 2023, p, 155). In 243 BCE, the court of Ashoka associated drought with the cutting down of trees and issued an edict that forbid damaging forests (Thapar, 2004). This was part of a strategy aimed at protecting wildlife and the environment so as to maintain a balance between human development and nature, including a commitment to prevent overexploitation, which was regarded as unsustainable and inconsistent with responsible government (see Keay, 2010). Respect for the environment became identified with enlightened leadership and good governance across much of Northern Africa, Southern Europe and Central and South-East Asia.

Exploitation not only damaged the earth. It reflected a more fundamental moral failing on the part of humankind (Starr, 2012). The Arthasastra by Kautilya (third century BCE) advocated protection of the environment for the good of the state, while Xenophon (fourth century BCE) wrote: "the earth willingly treats righteousness to those who can learn. For the better she is treated, the more good things she gives in return" (cited in Frankopan, 2023, p. 157).

Some of these ideas find expression in modern day. As argued by Sachs (1997, p. 33), nature, when it becomes the object of politics and development, turns into "environment". For Sachs, it is inappropriate and misleading to use the concepts of nature and environment interchangeably, as it hinders the recognition that "environment" is a specific construction of "nature", particular to human needs. This construction, a function of a Western substantivism (Smith and O'Keefe, 1980), overshadows alternatives that believe in the interconnectedness of living beings and the importance of harmonious relationships to ensure sustainability (Booth, 2008). The Southern African philosophy of Ubuntu provides an example of these values. Personhood is constructed on the basis of its relationships to others and to community, collective institutions: "I am because we are" (Mbiti, 1991). The transformation of nature through politics further highlights the importance of social justice, when assessing the impact of climate change. Such a shift in thinking can ensure climate change becomes a catalyst for empowerment by highlighting and then addressing injustice through social, economic and cultural transformation (Klein, 2017). Community-based solutions remind us that adaptation is possible, especially when informed by social coherence, collaboration, trust and a shared moral purpose (see Wallace-Wells, 2019; Klein, 2015). Ethiopia demonstrates this. The site of famine during the 1980s, likely caused by industrial population from the northern hemisphere, the country transformed itself through action aimed at protecting water sources, rebuilding soils, reforestation and investment in wind power and geothermal schemes (Williams, 2021). While the recent treaty between Australia and Tuvalu offers an example of how a high-income country is prepared to help a neighbouring low-income country at risk of climate change.[4]

Concluding Observations

The United Nations identifies climate change as the defining challenge of our era. This chapter examines its intersection with health inequalities through Du Bois's 'colour line' framework, revealing how racial hierarchies shape differential vulnerability. Britain exemplifies this duality: climate impacts exacerbate local racial disparities while reinforcing global structures of environmental racism (Mbembe, 2019; Williams, 2021). As Mos-Shogbamimum (cited in Williams, 2021, p. xii) asserts, systemic racism ensures unequal climate burdens, denying racialised communities 'equal value of life and liberty.'

This reflects Mbembe's (2019) necropolitics – where biopolitical power determines life chances through a "state of exception" (p.38). The resulting "symbolic violence" (Táíwò, 2021) perpetuates a false universalism that renders marginalised lives "superfluous" (Mbembe, 2019, p. 38), making climate and racial justice fundamentally inseparable.

As Du Bois (1920) recognised, detachment, however, is not an option. We must have faith in transformative social justice. For Du Bois (1945) respect for difference defines civilisation. Freedom is the right to be (culturally) different, without this difference becoming distorted by racist consequences. This implies a more sensitive and critical regard for the "art of living" (Fassin, 2009). Consistent with Du Bois's concerns, articulating strategic intent can enable us to specifically decipher our sense of the forthcoming and ensure it does not become the basis of an inevitable health inequality associated with the reproduction of racism. Exploring how racism is able to colonise the present while generating future consequences is – for Du Bois – fundamental to providing an alternative understanding, including the extent societies are able to facilitate global inclusion and empowerment, by promoting diverse definitions of human experience. This necessitates questioning the "hostile environments" (Garland-Thomson, 2019, p. 24) that create racism and using the insights generated to create more inclusive and equitable relationships. Consequently, the "other" is no longer a site of exclusionary practice but becomes transformed into a person with whom to engage when building social justice (see Mbembe, 2019).

The fight against systemic inequality requires actively disrupting the cyclical perpetuation of racist structures that many view as an unavoidable reality. Locating lived subjectivities within the sociopolitical environment in which they become realised enables us to redefine the "choice to survive" as the outcome of an ongoing and continuous struggle (see Hill Collins, 2017). Our preparation for an occurring future enables us to question the conditions which attempt to define that future. This is the basis of transformative action, which celebrates agency and mutuality (see Táíwò, 2023). Otherwise, continual assertions that something needs to be done are little more than "a fancy-dress parade and the blare of the trumpets" (Fanon, 1961), in which the politics of recognition is continually confused with the meaningful change associated with politics of difference (Taylor, 2018). Choices are required, and intentionality remains continual, as life carries within it, possible futures not realised. This is consistent with Du Bois's (1920) commitment to conceptualising future possibilities, in which aspiration provides the incentive for a transformative climate justice.

Notes

1 See: Raw sewage discharged in Thames again after Storm Ciarán (7 November 2023) https://www.bbc.co.uk/news/uk-england-oxfordshire-67333981; Surrey: Thousands still without water as major incident declared,

Nathalie Edell & Tanya Gupta, *BBC News* (6 November 2023) https://www.bbc.co.uk/news/uk-england-surrey-67330745

2 Four Statements on the Race Question, (United Nations Educational, Scientific and Cultural Organization, 1969) https://unesdoc.unesco.org/ark:/48223/pf0000122962

3 See: Nevada lithium mine leads to 'green colonialism' accusations, James Clayton & Ben Derico, BBC News (8 October 2023) https://www.bbc.co.uk/news/technology-67028209

4 See: Australia offers climate refuge to Tuvalu citizens, Tiffanie Turnbull, *BBC News*, Sydney (10 November 2023) https://www.bbc.co.uk/news/world-australia-67340907

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4 Climate Chaos and Human Health in Sri Lanka

Present and Future Complexity

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Sri Lanka, an island state, belongs to South Asia. The island is located in the Indian Ocean, southwest of the Bay of Bengal, and the Gulf of Mannar and Palk Strait separate the country from the Indian peninsula. Sri Lanka also shares a maritime border with India in the northwest and the Maldives in the southwest. The European colonialism began in Sri Lanka in 1505 with Portuguese, which ended in 1658. Then the Dutch ruled the country from 1658 to 1796. The British started their conquest of Sri Lanka in 1796. Until the takeover by the British Empire in 1815, Sri Lanka was never fully colonised previously. The British rule ended in Sri Lanka in 1948; however, the 1972 Constitution transformed Ceylon to the Republic of Sri Lanka while maintaining its links with the British Commonwealth.

While famous for its beautiful beaches, biodiversity, climate variations, and rich ecosystem, Sri Lanka has been somewhat unfortunate in its social, political, economic, cultural, and environmental domains. Sociopolitically, Sri Lanka experienced its first ethnic division riots in 1956 in the Eastern Province (Sunday Times, 2005). Ten years after receiving independence from the British Empire, Sri Lanka experienced the nationwide ethnic violence, mainly between Sinhala and Tamil communities, which laid the foundation for major divisions and later violence in the country (Sivanandan, 1984). Although, the 1960s were relatively peaceful in the sociopolitical domains, Sri Lanka went through major financial crises starting from June 15, 1965 (IMF, 2021). Since then, Sri Lanka has undergone about 16 financial crises officially. As we write this chapter, the country continues to experience financial hardships with rising cost of living and government income gradually decreasing.

In 1971, Sri Lanka experienced its major conflict between the Government of Ceylon and People's Liberation Front (Janatha Vimukthi Peramuna – JVP), which ended up killing approximately 8,000–15,000 people with unaccounted civilian deaths (Hettiarachchi and Sadanandan, 2001). Throughout the 1970s, Sri Lanka experienced various sociopolitical turmoil, including the formation of Tamil youth revolting against the government. The official point of this revolt can be marked by the assassination of Alfred Duraiappah, a lawyer who served as Mayor of Jaffna (Northern city of Sri Lanka) from 1970 to 1975.

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He was assassinated on July 27, 1975, and on April 25, 1978, the Liberation Tigers of Tamil Eelam (LTTE) claimed the responsibility for this (Rajasingham, 2002). On July 23, 1983, the LTTE attacked an army patrol in Jaffna, killing 13 soldiers and sparking anti-Tamil riots around the country, leaving several hundred dead and many people displaced. Since then, the conflict between the LTTE and the Government of Sri Lanka continued with various ceasefire agreements, peace talks, suicide bombings, and many forms of violence until the official ending on May 18, 2009. While different sources claim different numbers, it can be agreed that this war killed hundreds and thousands of people since its inception. It also displaced almost all people in the north and east of Sri Lanka, while the majority of the people killed in the war were rural youth from both Tamil and Sinhala communities. The most significant aspect of this conflict are the killings of a Sri Lankan President (1993) and a former Prime Minister of India (1991).

While the violent conflict between the LTTE was going on, the People's Liberation Front (Janatha Vimukthi Peramuna – JVP) and the Government of Sri Lanka engaged in another violent conflict from 1987 to 1989. Although this was a low-intensity conflict by nature, the JVP insurgency included subversion, assassinations, raids, and attacks, while the Government of Sri Lanka responded through counter-insurgency operations. This killed many hundreds and thousands of civilians and created an unsettled social, political, and cultural conditions within the country.

It is also important to note here that the constitutional evolution of Sri Lanka from 1948 to 1978, with subsequent amendments, all have certain colonial elements (Edrisinha and Selvakkumaran, 2000). Especially, the 1972 Constitution, which made Sri Lanka a republic had strict Westminster model, and the 1978 Constitution was a hybrid of an executive president and a prime minister. While commentators such as Mendis et al. (2023) argue that the 1978 Constitution was creative and novel, they also point out that the actual implementation failed to comply with the notion of constitutionalism at a satisfactory level for the people of Sri Lanka. In that, we want to point out that Sri Lanka continues to follow the same district borders, political and administrative systems, education and healthcare services that are based on colonial structures.

While going through various social, political, cultural, and economic crises, Sri Lanka is also a hotspot for natural hazards. Floods, droughts, storms/cyclones, epidemics, coastal erosion, and landslides are among the common natural hazards of the country. The 2004 Tsunami (December 26, 2004) brought the attention of policymakers towards natural hazards and the Disaster Management Act was enacted in May 2005. However, there is evidence that extreme events and hazards due to climate change are impacting the population health, biodiversity, coastal ecosystems, and infrastructure. In 2016, the Global Climate Risk Index ranked Sri Lanka the fourth most affected country by the climate crisis (Eckstein et al., 2017).

Regardless of the social, economic, political, cultural, and environmental challenges, Sri Lanka provides universal healthcare through the Ministry of Health. Unfortunately, the increased urbanisation and overcrowding, combined with underdevelopment and increased natural hazards, are increasing health vulnerabilities among its population. Infectious diseases (vector and rodent-borne), direct-weather related health risks, and food- and waterborne illnesses are becoming common. There is a lack of public and policy discourse about the health risks associated with the climate crisis within Sri Lanka, which increases the vulnerabilities and challenges. However, this is not just a Sri Lankan problem, but we find there are many examples at the global level.

Climate change is a complicated phenomenon, and it is mostly been seen as a scientific issue from the 1990s to until the 2010s. In the 2010s, substantial research has come out to critique the increasing bias of IPCC research towards physical and natural sciences and highlighted the ways in which social sciences are sidelined by the dominant 'science' discourse. Bjurström and Polk's (2011) paper is one among the important voices of critiques. This paper sharply highlights that IPCC reports and research 'downplays social analysis and separates nature and society' which is also reflected in the entire climate change research across the world in many ways. This paper points out the dominance of earth sciences and explains the history behind this dominance that the formation of international networks such as World Meteorological Organization and the American Geophysical Union (Edwards, 2004; Fleming, 1998; Bjurström and Polk, 2011). Even before Bjurström and Polk's (2011), scholars highlighted the ways in which IPCC downplays social, cultural, and political analyses in the reports (Cohen et al., 1998; Demeritt, 2001; Jasanoff and Wynne, 1998). In the early 2000s, scholars recognised the importance of emphasising social factors in addressing climate change, as it determines society's vulnerability and response to climate change. Nevertheless, this recognition amongst the scholars was limited, and there were huge gaps in the social, demographic, and economic factors in climate change (Rayner and Malone, 1998; Pielke and Sarewitz, 2005). But in the 2010s, this trend slowly changed, and there was an emphasis on social dimensions of climate change. However, again as Bjurström and Polk's (2011) highlight, social sciences are dominated by 'economics' and 'environmental studies' – primarily by 'economics.' Most of the journals that are frequently cited by the IPCC's third assessment report in 'social sciences' fields are from 'economics and 'geography' disciplines but not majorly from any other social sciences disciplines. Though IPCC reports have continued to address the links between climate change and health in various forms, the discussions of health are primarily cantered around two dominant discourses 'environmental health' and 'medicine – modern medicine.'

This chapter examines the social, cultural, and religious aspects of how people in Sri Lanka are dealing with the climate crisis. Of course, these

experiences – at both policy level and community level – are covered within coloniality, global and local politics, as well as various inabilities at individual, community, and social domains. Within this context, we start this chapter with national plans and policies for climate change in Sri Lanka, then move onto critically engage with the traditional medicine, which has the potential to provide certain health solutions for climate change, however been ignored at large. In this context, we examine lived experiences of communities by pointing towards various examples in different parts of Sri Lanka that unpack the challenges of the climate crisis within the challenges of underdevelopment of an island state. Towards the conclusion, this chapter points towards the importance of establishing a stronger discourse of development discourse with human and nature relationship at the centre.

Finally, it is important to note that as a strategy of gap filling in policy domains, we are comparing Sri Lanka with its larger neighbour – India, not because of the geographical proximity but because of the connectivity of the climate-related impacts and activities of both countries. Further, India and Sri Lanka share a long sociocultural and political history, which can complement within this chapter to fill the gaps in the Sri Lankan context.

National Plans for Climate Change

As we reviewed many scientific and government reports of climate change in Sri Lanka, we have found that climate change and health have always been one of the focal points in many policy instruments in recent years. For example, Sri Lanka's National Adaptation Plan for Climate Change includes health as one of the key sectors and listed four priority areas (climate altering pollutant, diseases, hazardous events and health impacts, and heat/thermal stress). The plan also details how the climate change policy of Sri Lanka is aligned with Intended Nationally Determined Contributions (INDCs) made in Paris Agreement, and it summarises the overall plans to address the health impacts of climate change in Sri Lanka. Some of these plans include establishing a surveillance programme for climate-induced diseases, forming specialised research institutions, launching climate change awareness programmes, and strengthening mechanisms for information-sharing between government agencies (Climate Change Secretariat of Sri Lanka, 2016). Additionally, Sri Lanka has recognised the vulnerability of its health sector to climate change, including the potential for increased health hazards such as the spread of vector-borne diseases like malaria and dengue fever due to changing climate patterns (World Health Organization, 2015).

India has undertaken various steps to address climate change impacts on health. India's climate change policy framework and state-level climate action plans repeatedly emphasise the need for integrated approaches to respond to climate change, including specific focus on health sector resilience (Majra and Gur, 2009). India's first systematic and formal step to address climate change

impacts was the launching of Indian National Action Plan on Climate Change (NAPCC). It was spearheaded by the Prime Minister's Council on Climate Change in 2008 under the leadership of the then Prime Minister Manmohan Singh. This plan focuses on eight missions, from National Solar Mission to National Mission on Strategic Knowledge for Climate Change. Though there was no separate mission that linked climate change and health, this report explicitly addressed climate change impacts on health throughout the report under various missions and emphasised the importance to address them. It also cautions the ways in which the projected climate change alters the distribution of vector species which will intensify the spread of several diseases. Also, it raises concerns on environmental health and proposed programmes of scientific, health, and public reach out programmes to address climate change impacts on health (Pandve, 2009). From 2008 to 2014, though there were several steps undertaken to address climate change impacts on health by both the Union and the State governments of India, the primary step was undertaken in 2014 – the Indian government introduced four new missions, including one for 'health' – this mission guides the Indian state to address climate change impacts on health through a multi-pronged approach. The Indian government established a National Expert Group on Climate Change and Health to prepare action plans and strategies for adaptation. This expert group aims to reduce climate-sensitive illnesses by integrating health initiatives from other missions and ministries. The National Action Plan on Climate Change and Human Health (NAPCCHH) is to strengthen the health of all Indians, especially vulnerable groups, against climate-sensitive diseases. From 2014 to 2018, the Union Government of India made various regional consultations across states and the Union Territories. These efforts include the formation of a 'State Environment Health Cell' at the level of the State Health Ministry, which constitutes a team of experts with representatives from various ministries at the union and state levels. India demonstrated its commitment to sustainable healthcare by signing the Male Declaration, pledging to implement eco-friendly technologies and develop climate-resilient healthcare infrastructure – an initiative currently underway (Government of India, 2018).

As it is clear, both Sri Lanka and India have appointed noted special committees to look into the possible effects of climate change on human and animal health. For example, Sri Lanka's National Climate Change Policy includes policy statements that recognise the vulnerability to adverse impacts of climate change in the health sector and take action to safeguard public health (Ministry of Mahaweli Development and Environment, 2016). The policy draft of Sri Lanka clearly identifies the key stakeholders of the National Adaptation Plan, ranging from government officials to local governments and the general public. At the end of this plan, it also lists the names of key health officers (doctors) who specialise in indigenous medicine (Climate Change Secretariat of Sri Lanka, 2016). Similarly, the Ministry of Health of the

Government of Sri Lanka has a separate Indigenous Medicine Section – the field of indigenous medicine has a history spanning several decades in the modern health systems of Sri Lanka. Currently, this section oversees and regulates Ayurveda, Siddha, Unani, Deshiya Chikithsa, and homeopathy in Sri Lanka, with different range of objectives and functions – including the preservation of traditional medicine, the establishment and management of traditional medicine hospitals, and the regulation of these hospitals and traditional medicine drug manufacturers. Overall, the history of indigenous medicine in Sri Lanka and India is deeply interconnected and shares many parallels. The centuries-long colonial rule in both Sri Lanka and India severely undermined traditional medicinal systems in favour of Western medicine, leading to a decline in the practice and recognition of indigenous medicines, even during the post-independence period.

Recent research shows that the disconnect between climate change and health in the Sri Lankan context is not surprising. Inadequate data systems, institutional weaknesses, limited capacity to design and implement viable programmes, and governance gaps create challenges to dealing with the climate crisis in Sri Lanka (Menon, 2025). Given the challenges of underdevelopment, policymakers at the national level and health officials in the front line are prioritising responding to diseases, nutrition needs, and other health challenges without realising the central role of the climate crisis in all the problems. A country-level empirical study shows that most medical colleges in India have not incorporated climate change into their curriculum. Although most medical students (who are the respondents of this study) are sensitised about climate change, they reported that they have never advocated for climate-health (Govind et al., 2022). This is not much different in Sri Lanka. Currently, no large-scale empirical evidence is available to examine the awareness of health and medical staff on climate change impacts in Sri Lanka. However, there is substantial evidence that the Sri Lankan state increasingly emphasises the links between climate change and health in recent policy documents and action plans (Ministry of the Environment, 2010; Climate Change Secretariat, 2016). Still, much of the climate change information and actions are limited to the national level and have not reached the periphery, especially at the primary level, resulting in limited awareness among local medical officials on climate change, as well as disaster preparedness and training. We should note that Sri Lanka is a post-conflict state, and it passed through three decades of long and violent ethnic conflict and violence – even today, the availability of health services and the distribution of human-related health resources across Sri Lanka is highly uneven due to underdevelopment. Though programmes on disaster resilience and climate change adaptation are gearing up in Sri Lanka, they are not on par with the requirements, and there have been severe constraints due to human resource shortages in health services and strengthening of disaster resilience at the local levels (Farley et al., 2017).

Traditional Medicine: The Current Context

The Sri Lankan Ministry of Indigenous Medicine Policy Report by the World Bank (2005) states that Sri Lanka is the only country to establish a separate ministry for indigenous medicine, with objectives including regulating and maintaining the quality of indigenous medicine to meet international standards and sensitising students by introducing indigenous knowledge into the formal school curriculum. This ministry adopts the WHO guidelines for research and evaluation methodologies on traditional medicine (WHO, 2000). This report states that the ministry has 30 policies to accomplish its vision and mission. It should also be noted that the official website for indigenous medicine of the Government of Sri Lanka does not provide specific details on the number of policies. In the circular section of this website, we can find the Ayurveda Act, No. 31 of 1961, which was published by the Government of Sri Lanka in August 2024. This document provides a comprehensive account of the Ayurveda Act, discussing how Ayurveda medicine, physicians, and drugs should be registered, regulated, and governed. It also outlines the provisions for licensing and lists the details of declared medicinal plants, among other information. Overall, this document gives the impression that the Sri Lankan government is making significant efforts to regulate, promote, and improve the quality of indigenous medicine and drugs. However, the Indigenous Medicine Section of the Ministry of Health, Department of Ayurveda of the Ministry of Health, and the available government policy notes do not discuss anything related to the 'philosophy' behind the indigenous medicine.

Indigenous or traditional medicines of Asia, particularly Ayurveda and Siddha, emphasise a holistic approach to health and wellbeing and are deeply embedded in the cultural systems of South Asia. Nevertheless, both Sri Lanka and India perceive and adopt a mechanical approach towards indigenous medical systems and their drugs. As multiple state reports proclaim, the prime objective of both the states have been to regulate indigenous medicine to ensure 'quality' and 'standards.' We perceive that this mechanical approach towards indigenous medical systems fundamentally go against them, especially the core philosophy of Ayurveda and Siddha. Traditionally, these medical systems do not focus solely on 'curing' patients from diseases but also to ensure the living is 'free' from diseases.

For example, ancient Ayurveda (and contemporary traditional Ayurvedic practice) goes beyond the human body, addressing food, nature, environment, mental health, spirituality, the function of the universe, and more. Literally, the term 'Ayurveda' means 'the science of life.' For human health, Ayurveda primarily discusses the prevention of diseases and the importance of holistic wellbeing rather than merely curing the diseases. It highlights the importance of diet, nutrition, daily and seasonal routines (and physical exercises), and holistic healing. However, most government policy reports on indigenous medicines in both Sri Lanka and India place prime importance on regulating

indigenous medical institutions, drugs, and developing research institutes. While both nations make genuine efforts to ensure the quality and standardisation of traditional drugs, the approach has been similar to modern medicine, with little emphasis on incorporating the 'philosophy' and essential 'holistic' nature of indigenous medicinal practices. Moreover, although climate change is frequently mentioned in recent health and public health policy reports – which are predominantly focused on modern medicine in Sri Lanka and – India, it is surprising that climate change has been largely ignored in native/traditional/indigenous medicine policy reports.

Across the world, particularly in developed and developing nations, there has been a growing interest in traditional/indigenous medicines over the past few decades. There has been an increasing realisation of the shortcomings of Western biomedicine, including side effects, lack of proper treatments for many chronic diseases, its expensive nature, microbial resistance, and the recurring effects of diseases. As a result, increasing numbers of people are shifting their interest towards Ayurveda, Siddha, and other traditional/indigenous medical systems. Traditional medicines have become alternative/complementary medicines in many developed countries, and to exploit this opportunity, several national and international food and herbal companies have entered into this market (Pandey et al., 2013). The United Nations in 2006 estimated that around 80% of the people (indigenous people) in developing countries do not have the capacity to access modern medical procedures such as drugs and vaccines. They are largely dependent on indigenous medicines, particularly for primary healthcare needs. A good proportion of them are the beneficiaries of both indigenous and Western medicine to address their illnesses (Inter-Agency Support Group on Indigenous People's Issues, 2014). Whereas the WHO-SAGE database of 2007–2020 shows that only 11.7% of the population are dependent on indigenous medicine. And this number is less (only 3%) in China, Russia, Ghana, and Mexico. There have been other studies that report different numbers. For example, a study conducted in 35 districts in India shows that around 14% of sick people depend on traditional medicine to cure their illnesses (Singh et al., 2005). Another relatively recent study based on National Sample Surveys (71st and 75th surveys) shows that around 30% of Indian households utilise traditional medical systems to address various illnesses.[1] This study brings some interesting findings, showing that medical pluralism is widespread across the country, in both rural and urban regions. However, the choice of medicine depends on the nature of the ailments and various factors – primarily the socio-economic status of the households. For example, the usage of unprotected resources among households also makes a difference in choosing between traditional and modern medicine. This study shows that a large proportion of Adivasi communities continue to be dependent on traditional medicines for primary healthcare needs and many other ailments. However, we cannot simply correlate urban and educated people with a greater dependence on modern medicine, as the study shows that traditional

medicine is also popular among educated people and in urban areas – as they believe that traditional medicine has limited side effects and greater potential (Mohanty and Sharma, 2021). We could not find such large-scale empirical evidence on the utilisation of traditional medicines in Sri Lankan households.

Sri Lanka has long been recognised as the state that has effective primary healthcare system and the state that does far better than India and provides quality health support at low cost than the high-income countries such as the United States and the UK (Halstead et al., 1985; Jones and Liyanage, 2018). Though Sri Lanka has devoted a separate section for indigenous medicine under the Ministry of Health, and it is being administered by a state minister and thousands of full-time staff, it is still complicated to know the accurate and latest data of the numbers of traditional medicine hospitals, dispensaries, and the numbers of traditional medicine practitioners/doctors.

Unlike the legal framework in India, the legal framework in Sri Lanka to regulate the indigenous medicine is still complicated, and many such conceptual clarifications are yet to be addressed. For example, the legal framework in Sri Lanka addresses traditional/indigenous medicine holistically and gives more emphasis to Ayurveda and Desiya Chikitsa systems. The Indigenous Medicine Section of the Government of Sri Lanka provides limited information of the efforts taken to address the health requirements of Sri Lankans exclusively through traditional medicine though this website provides the list of Ayurvedic hospitals, dispensaries, and other institutions. Similarly, the department of Ayurveda of the Ministry of Health lists various hospitals, including teaching and research hospitals; however, it does not provide the details of the exact and latest numbers of hospitals. Interestingly, according to the Ayurveda Act No. 31 of 1961 in Sri Lanka, the term 'ayurveda' is defined as follows:

> [A]yurveda includes the Siddha and Unani and Desiya Chikitsa systems of medicine and surgery and any other system of medicine indigenous to Asian countries and recognized as such by their respective Governments and the expression 'ayurvedic' shall be construed accordingly.
>
> (Ceylon Government Gazette, 1961)

Over the past decades, there have been many amendments in the Ayurveda Act in Sri Lanka – this made provisions for the establishment of the Department of Ayurveda, registration of Ayurvedic hospitals, and the regulation of Ayurvedic pharmacies, dispensaries, and more. Also, the amendments established an Ayurveda Education and Hospital Board and the establishment of an Ayurvedic committee. Recently, AYURVEDA (AMENDMENT) ACT, No. 19 OF 2023 repealed the definition of the expression 'Ayurveda' and the substitution and provided the following definition for the term 'Ayurveda': "Ayurveda" includes the Ayurveda, Siddha, Unani and Desiya Chikitsa systems of medicine and surgery and any other system of medicine indigenous to

Asian countries and recognized as such by the Governments of such respective countries" (Gazette of the Democratic Socialist Republic of Sri Lanka, 2023).

Our observation of the implementation of traditional medicine practices comes through the colonial way of thinking. While the traditional approaches facilitate a harmonious relationship between human population and nature, the colonial project has undermined these practices. In that, Western medicine and medical doctors (not nurses or midwives) are dominating the policymaking, management, and national-level administration. This has created a useful and much-needed discussion and dialogue between traditional medicine and Western medicine to deal with health risks related to climate change.

Traditional Medicine: A Missed Opportunity?

Over the past decades, the Sri Lankan state has taken both local and global steps to protect and promote indigenous medicine and devised legal frameworks and community models – which are successful in some ways. Nevertheless, from our review, we also found that the understanding and incorporation of climate change discussions in the policy frameworks of traditional medicine have been highly limited. Also, the discussions of rituals, religious beliefs, sacred practices, and indigenous medical lore have rarely been considered in the policy and governance reports (Google Arts and Culture, 2023). In many ways, both Sri Lanka and Indian states attempt to 'regulate' traditional medicines and ensure 'quality assurance' without emphasising on the religious and cultural layers of the medical systems. The separation of Ayurveda from its original "vedic" roots and commoditisation to the global markets (particularly, Europe) have already been extensively discussed by some scholars (Bode, 2008; Islam, 2012; Viale and Vicol, 2023). In the contemporary period, Ayurveda is not being practised in the ways that it used to be, and it is largely in the hands of private corporate hospitals, private doctors, the state, and herbal manufacturers. The numbers of 'traditional' and 'lineage' Ayurvedic practitioners have been dwindling in many regions of Sri Lanka and India. Bode (2008) discusses the ways in which market capitalism has shaped and influenced traditional medical (Ayurveda and Unani) practices over the past two decades, and he notes that over 90% of Ayurveda and Unani medicines are being purchased by the urban middle-class people as over-the-counter brands. The study published in 2007 reported that around 400,000 quacks practise in India as Ayurvedic, Siddha, Tibb, and Unani practitioners. The numbers are far high in the case of allopathic quacks as well (Ramesh, 2007). The latest estimates of quacks who disguise as traditional practitioners in Sri Lanka are not available in the public search. We can speculate that the numbers could be as high as in India. Given this situation, it is expected that both Sri Lanka and India have focused more on regulating traditional medicines and herbal drugs rather than making traditional medical practices to address health complications caused by climate change.

Bode (2006) provides a rough estimate of the rise in users of traditional medicines (Ayurveda and Unani) to around 100 million people in the last decade of the twentieth century, most of whom are from the affluent urban middle class. There has been an increase in the positive image of Ayurveda and other traditional medicines in mass media, resulting in the proliferation of urban 'consumers,' which has also modified the image and substance of Ayurvedic products – to put it simply, 'commodification' of Ayurveda and traditional medicines. The urban middle class has shown steadily growing interest in traditional medicine systems in recent years. Islam (2012) traces the relationship between the British colonial role and Ayurveda and has noted that it was dialectic. In the initial phase of colonial rule, the British government showed sympathetic support to Ayurveda and tried to work with traditional Ayurvedic practitioners, knowing the 'reality.' The colonial expansion of the nineteenth century marked a turning point for Ayurveda, particularly after the establishment of Calcutta Medical College in 1835. During this period, British authorities systematically marginalised Ayurvedic practices, leading to its exclusion from mainstream medical education and eventual confinement to Sanskrit colleges. The emerging Indian nationalist elite perceived Ayurveda as their 'pride' and continued to promote Ayurvedic education in separate institutions. Nevertheless, the unequal power relations naturally favoured Western biomedicine, and it continued in post-independent India as well. Though there were some rising discussions and interests shown to integrate biomedicine and Ayurveda (and other traditional medicine) by the post-independent Indian governments, these efforts were largely unsuccessful, and the deep divide between biomedicine and Ayurveda persists even today. This dialectical relationship between Ayurveda and the colonial rule is similar to the case of Sri Lanka. Islam (2012) by referring to various scholars (Langford, 2002; Welch, 2008; Prashad, 2000; Selby, 2005) traces the ways in which traditional Ayurvedic practitioners equipped themselves and transformed Ayurvedic education to compete with the 'powerful' Western biomedicine such as by adopting European institutional practice in educating Ayurveda, the formation of various Ayurvedic colleges, 'traditional' Ayurvedic scholars learnt allopathic perspectives and started prescribing 'allopathic' medicines to patients based on the contexts, and this is continuing even today in both Sri Lanka and India. Apart from that, the final phase of orientalist play happened in the post 1960s and 1970s, when Ayurveda practitioners started projecting it as 'Spiritualism of the East' and 'Beauty of the mystery of India' (and also Sri Lanka). This post-colonial revival era that occurred in India also had an influence on her neighbour 'Sri Lanka.' In this new-age orientalism, Ayurveda has spread to urban professionals, entrepreneurs, and elites in Asia, as well as to the West as a commodified version driven by aggressive and smart marketing by mass media and is being projected as part of the "Wellness and Spa Culture" (Islam, 2012). Here comes the question: Both Western biomedicine and traditional medical practices of Asia have already been commodified – though traditional medical practices

have not been commodified as extensively as biomedicine; they are not practised as they were a few centuries ago. In the era of climate change and extreme events, how can discussions of climate change and environmental health be successfully incorporated into these different medical practices? Though there have been policy attempts in Sri Lanka to link climate change and health, as we discussed earlier, these discussions have not yet reached traditional/indigenous medical practitioners, hospitals, or education curricula.

Around three million people (approximately 11% of Sri Lankans) are dependent on traditional medicine for various purposes (Liyanagunawardena, 2022). Here, we also note that medical pluralism is pervasive across Sri Lanka. A large proportion of Sri Lankans depend on traditional medicines for both minor illnesses and chronic health issues. Jones and Liyanage (2018) report that of the 45 million outpatients who visited Sri Lankan hospitals for various issues, around 5% of them were treated by traditional practitioners. However, discussions of climate change in Ayurvedic (and other traditional medical systems) curricula have been rare and highly limited.

There is a wealth of scientific evidence that climate change is real and inevitable, and its impacts are already being felt, and in the future, its impacts will be more pronounced across the world. From 2000 to 2016, the world saw a significant rise of approximately 125 million people who had been exposed to heatwaves (WHO, 2025b). In 2015 alone, an astounding 175 million more people faced heatwaves compared to the previous years. From 2030 to 2050, we can expect 250,000 extra deaths every year from malnutrition, malaria, diarrhoea, and heat stress. Vulnerable groups like the elderly, babies, pregnant women, outdoor workers, athletes, and those struggling with poverty take the brunt. Heat and gender are vital factors that determine the brunt of the negative implications of climate change (WHO, 2025a).

As Emergency Events Database reported, over the past half-century, climatologic hazards triggered 1,094 disasters, making up 10% of all CRDs, resulted in 703,416 fatalities, and impacted a staggering 2.5 billion people all over the world. Droughts took the lead, accounting for 62% of these climatologic disasters and a devastating 99.6% of their mortality. Wildfires (forest and land fires) caused 36% of climatologic disasters but contributed to only 0.3% of their mortality. Importantly, 99.7% of people affected by climatologic disasters in the last 50 years were hit by droughts (EM-DAT, 2019).

Community Experiences of Climate-Related Challenges

As briefly mentioned towards the end of the previous section, the Sri Lankan traditional way of life has been discarded within the coloniality of knowledge and political and economic system. Traditionally, the Sri Lankan population were largely engaging in livelihoods that are related to farming, fishing, carpentry, and various conventional practices. In this context, the social, cultural, and religious beliefs of the population had a strong connection as well as

respect towards nature. Much of these beliefs were based on Buddhist, Hindu, and other native philosophies, as well as various local deities that were worshipped. While not going into historical details, we argue that like in India, Sri Lankan sociocultural foundations are strongly connected to the religious and philosophical beliefs of people. However, all this changed as well as the natural evolution of societies were destroyed by the European colonial project from 1505 onwards.

The most notable impact has been on the 'education' interventions by the colonial masters. Alongside, economic, political, and environmental interventions, the colonial era introduced a new educational system and institutional framework in Sri Lanka. This laid the foundation for pushing the ideas of modernity and educational governance, which are different to pre-colonial learning systems. The establishment of schools, colleges, universities, and administrative institutions by the colonial masters, especially the British, served as a major influence in training future generations to follow European (and later North American) intellectualism and, most importantly, a generation (and class) that is capable of continuing the colonialism administrative systems. The legacies of Western-style education, the high importance of English as the most important language, and the modernity that promotes globalisation and marketisation reflect the continuing impact of coloniality on Sri Lanka's contemporary sociocultural as well as political, economic, and environmental landscape.

According to Sumathipala and Kannangara (1968), when the British Empire gained the full control of the island of Sri Lanka from the Dutch possession, there were two separate education systems in the country. There was a network of Christian parish schools and a larger number of traditional schools – Buddhist and Hindu temples. However, in 1832, the British Empire decided to abolish Sinhalese and Tamil traditional schools, and at the same time, English language schools were built in Western, Central, North Central, Southern, and Northern Provinces (Janíková, 2018). The British Empire's approach to education was based on the perspective that the native and traditional learning, including the local languages and practices, were of little importance, and European knowledge and English language education would lead to the moral and intellectual improvement of the colonised (Coperehewa, 2011).

In this historical context, what became evident is that through the colonial impacts, Sri Lanka transitioned from an organic and traditional society to 'modern' society. The importance of modernity has been imposed on the Sri Lankan population over their traditional ways of living through the European colonialism (Harish et al., 2021). As we write this chapter, the burden of this process is becoming more and more evident in the current social, political, economic, and environmental crisis Sri Lanka is going through. The Sri Lankan population has become a frustrated and confused mass between modernity and tradition. The following three examples show this confusion in the context of the climate crisis in Sri Lanka. These examples are based on our observations and engagement with the individuals and families in Sri

Lanka over the years and presented here to provide ethnographic evidence of the challenge the island is going through.

1) Due to the changes in weather patterns, Eastern Sri Lanka is experiencing extreme weather events such as cyclones, droughts, and floods. Two years ago, a farmer living in Batticaloa of the Eastern Province with his three children and wife with the extended family started to experience bad harvesting. He was not particularly religious and enjoyed his alcohol and meat and used to have a feast every Tuesday at his home. Since the bad harvesting, the family started to observe that this farmer is becoming more and more religious. First, he gave up his occasional alcohol drinking, and one day he announced that he has become a strict vegetarian. He became a regular visitor to the Sri Mamang Eswarar Temple and avoided most of his lay duties as a householder.
2) Colombo, the capital city of Sri Lanka has been experiencing flash floods in recent years. Partly due to changing weather patterns and problems around infrastructure, these floods halt many socio-economic activities. In 2021, this particular family which has moved to Colombo looking for economic opportunities got their shelter in the slum destroyed due to flash floods. They lost all their valuables. Soon after, they decided to go back to their home village in the South and start with fishing as they used to do before.
3) There was a daily wager who lifted heavy goods for merchants in downtown Colombo. This particular area he worked was polluted with vehicle fumes, suffered from extreme heat, and was always busy with people. After 15 years of working, he found that he cannot lift heavy goods anymore. Suffering from fever and cough, when he went to see a doctor, he was told that he is suffering from stage-2 lung cancer. The doctor explained him that as a lifter, he breathes heavily, and the polluted air might have caused the cancer. The doctor provided him with treatment options, which would cost a lot of money. After deep thinking, he decided to leave Colombo and go away to a monastery in a jungle to become a Buddhist monk.

These three examples point out that the climate crisis is creating overall risks to people's social, political, cultural, economic, and environmental health. Regardless of the impact of modernity and coloniality, individuals and communities react to these health risks by using their social, cultural, and religious beliefs. Poor working conditions, uncertain weather patterns, pollution, and various types of illnesses are all interlinked towards the disconnection between uneven development processes and nature that are creating health risks. Natural hazards increase the risks of tuberculosis (TB), cancer, hepatitis, and typhoid as well as infectious diseases such as dengue, Acute Lower Respiratory Infections (ALRI), and Leptospirosis (Ministry of Forestry and Environment, 2000).

Considering the various impacts of the climate crisis on Sri Lanka, the healthcare system is struggling to meet the demands of existing and new health risks. The increased health risks due to the climate crisis worsen the already declining healthcare system of the country.

Towards a Conclusion

Densely populated coastal islands such as Sri Lanka are particularly vulnerable to the impacts of climate change and extreme events on multiple fronts. In our research for this chapter, we found that most scientific studies that link climate change and health impacts have been published by health scientists (including physicians), health demographers, epidemiologists, statisticians, climate scientists, and atmospheric scientists, primarily using mathematical and quantitative approaches. What is notably missing are contributions from social scientists, particularly anthropologists, medical sociologists, environmental humanists, and environmental philosophers. There is a lack of comprehensive anthropological research on the health consequences of climate change in South Asia, particularly in Sri Lanka. Predicting the health impacts of the climate crisis is challenging, and after such events, health infrastructure is often severely compromised, with clinics, power, and roads damaged or washed away.

Towards the conclusion of this chapter, we point out that there is an urgent need for an island state like Sri Lanka to establish an inclusive discourse on development with a specific focus on the climate crisis. It is high time to realise that the modernity that comes through coloniality is a failure in facilitating a harmonious human and nature relationship. The traditional and indigenous knowledge that is embedded in Sri Lankan society and culture can perhaps point towards solutions that are useful in contemporary and future challenges related to the climate crisis.

Note

1 Both are large-scale studies conducted by the government of India across thousands of villages and urban blocks in India. The NSS 71st round was conducted between January and June 2014, and the NSS 75th round was surveyed during July 2017–June 2018.

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5 Climate Change, Disasters and Health in St Vincent and the Grenadines

Idelia Ferdinand

This chapter is based on a critical review of publications on disaster, climate change and related health impacts and experiences in Saint Vincent and the Grenadines (SVG) to identify relationships and concerns. The aim of this chapter is to critically understand the impacts of climate change on the health of populations that are living in Small Island Developing States (SIDS) by analysing the case of SVG.

The world is coming to the realisation that climate change is real and is already impacting many nations, lives, and livelihood, especially in SIDS. There is a need to act fast and to act now since there is already enough Greenhouse Gases (GHGs) in the atmosphere to increase temperatures in the future, therefore, things may get worse before they get better. Over the past hundred years, it is estimated that Earth's average temperature has risen by 0.7°C, and based on the pattern of burning of fossil fuel it will be 2°C warmer than it was before humans started burning coal, oil and gas for energy, transport, and industry (Campbell-Lendrum et al., 2023). The Paris Agreement, 2015 signed by close to 200 Parties at the UN Climate Change Conference (COP21) in Paris, France was aimed at limiting global temperature to 1.5°C above preindustrial levels (United Nations Framework Convention on Climate Change, 2016 (PAHO, 2019).

However, according to the Intergovernmental Panel on Climate Change (2023) it is likely that the 1.5°C limit will be surpassed by the end of the century. This has serious implications for human survival especially in the most vulnerable parts of the world such as the SIDS and for the most vulnerable people including farmers, fisherfolks, elderly, and those occupying coastal plains. The Earth's climate varies and changes constantly, and there is evidence of major changes in the past, but the more prevalent increase in global temperature is significant enough to raise great concerns. The changes are attributed to an increase in the emission of greenhouse gases (GHGs) such as CO_2 in the atmosphere, mainly due to human activities such as the burning of fossil fuel for energy. The increase in the concentration of GHGs in the atmosphere is occurring faster than is naturally expected and faster than human society can adjust. The increase in GHGS has also resulted in the melting of

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glaciers, contributing to sea level rise which threatens coastal development (National Research Council, 2020).

Temperature extremes can result in a reduction in crop yield and marine resources, which can have a cascading effect, including loss of jobs, scarcity of food, rise in the cost of production, and an increase in prices for agricultural produce, fish, and fish products. In addition, people who work in these primary industries are the first to lose their jobs which can push them into poverty or further into poverty thereby increasing their vulnerability to face a crisis. Scientific evidence also attributes change in global climate to the increase in disaster risk due to weather extremes which contribute to flooding, the increased frequency and severity of storms and hurricanes, drought and coastal erosion (National Research Council. 2020). The impacts from extreme events threaten the livelihoods of many coastal communities, especially in SIDS which are generally dependent on tourism, agriculture, and marine resources (Hernández-Delgado, 2015).

Communities that rely on fishing, farming, and the land for their livelihoods are already at risk from global economic setbacks, and these are being exacerbated by the effects of changing climate. Such persons may be unable to access or afford the healthcare they need even when the service is available. Climate change is intertwined with human health conditions and will have the greatest impact on the most vulnerable, including women, children, elderly, ethnic minorities, people with pre-existing health issues, and the poverty stricken (World Bank Group, 2024). Climate change and disasters threaten human health globally and is even more striking for SIDS) exposed to the increasing threat of climate change and variability and prone to multiple hazards. Increasing temperatures result in exposure to extreme heat and contributes to an increase in non-communicable diseases and the spread of infectious diseases (Campbell-Lendrum et al., 2023). The diseases include dengue fever, cholera, and malaria (Anwar et al., 2019)

The increase in disasters because of drought, rising sea levels, floods, hurricane and storms also expose many persons to diseases (Campbell-Lendrum et al., 2023). Such high-risk events put pressure on already-overstressed health systems and can result in health disasters. According to PAHO (2019), climate change contributes to many health issues and places additional burden on global health, especially in conditions such as malnutrition, which is estimated to kill about 3.7 million people per year, diarrhoea which is estimated to kill 1.9 million, and malaria which is estimated to kill 0.9 million per year. Climate change increases the chances of water- and food-borne illnesses. Air pollution or poor-quality air triggered by climate change sets off allergies and respiratory illnesses. Disasters not only affect physical health but also mental health. Extreme weather events can lead to acute mental health conditions such as anxiety, depression and post-traumatic stress (Campbell-Lendrum et al., 2023).

According to WHO (2023), climate change-related deaths would be higher than estimated if an account is taken of those linked to stress and declining

wellbeing because of property damage, loss of livelihoods, and other factors which affect the overall socio-economic and health conditions. People's socio-economic conditions add to climate-related mortality, grief, and psychosocial state. There is still much research needed on the impact of climate change on health, especially on a country level; this would help to ensure that mitigation and adaptation measures are guided by the evidence. If left unchecked, the impact of climate change on health and the health system can set back the achievement of sustainable development goal 3 (SDG3) on good health and wellbeing, which seeks to "Ensure Healthy lives and promote wellbeing for all at all ages" (Sustainable Development Goals, n.d.) While everyone will feel the effects of climate change, some will feel it more than others, especially the SIDS.

Like anywhere else on this planet, geography and historical events shape social, political, cultural, economic, and environmental realities of SIDS. For more than millennia, the attraction of living in small islands has interest various invaders and colonisers, who have occupied these islands by force. The European colonial powers often used these small islands for their economic benefits without considering the native populations of these lands. Although many SIDS are independent nations, not all of them can call themselves truly independent. The Cayman Islands, British Virgin Islands, American Samoa, New Caledonia, and Guam are a few examples where the colonial powers are not willing to let go of small islands. In that sense, colonialism is not simply an event that happened in the past, and it does not end when colonisers leave. In that, SIDS are marked by a political, economic, and cultural thread that connects the colonised and colonising countries. While this chapter is not delving into colonial history, understanding climate change and health risks of SIDS needs to be examined within this context.

Climate Change and SIDS

Since 1992, as part of Agenda 21, SIDS have been recognised for their unique characteristics, including low lying coastal communities; limited and fragile economic activities such as agriculture, tourism, and fishing; small population of varying sizes; disaster proneness; small open economies; remoteness; and high transport cost. The identified conditions also designate SIDS as highly vulnerable to climate change and other development challenges, but these have been granted special attention and focus for over the last 32 years. Climate change is considered as one of the greatest barriers towards the achievement of sustainable development goals for SIDS (Briguglio et al., 2007).

Despite all the attention given to the effects of climate change on SIDS, the situation seems graver every year and the resources to combat the situation more limited. Where funding is available, it is inaccessible to countries because of the bureaucracies in place that hinder access to such funding (Lewis, 2022). Notwithstanding this, initiatives such as the Global

Environment Facility Small Grants Programme (GEF SGP) have made funds available to many civil society and community-based organisations to address environmental issues and build capacity through financial and technical support. SIDS contributes a relatively small percent of less than 1% GHGs to global warming; however, they face impacts more than the countries that are major contributors to GHG emissions (Briguglio et al., 2007). Such concerns raise questions about the implementation and effectiveness of the strategies being put in place, as SIDS seems to be buckling under the pressures of climate change.

During the fourth SIDS conference, which concluded in May 2024, SIDS addressed similar issues to the previous three conferences on the impacts of climate change, especially sea level rise (Earth Negotiations Bulletin, 2024). Many concerns have been highlighted from the inaugural SIDS global conference first held in Barbados in 1994 resulting in the Barbados Programme of Action (BPOA, 1994). The BPOA pinpointed a programme with a focus on 14 areas with climate change and sea level rise as number one. Ten years after, the endorsement of the Mauritius Strategy for the further implementation of the BPOA (MSI, 2005), a major concern was that the hostile impacts of climate change and sea level rise present substantial risks to the sustainable development of SIDS, and the long-term effects of climate change may threaten the very existence of some SIDS. The experiences from SIDS indicate that they were already experiencing the serious effects of climate change and sea level rise and needed the support to speed up actions to avert some of the future challenges. Hence, the international community committed their full support to mitigation and adaptation measures to address climate change in SIDS.

The third SIDS conference rolled out the SAMOA Pathway 2014, where it was recognised that

> the adverse impacts of sea level rise and other adverse impacts of climate change continue to pose a significant risk to Small Island Developing States and their efforts to achieve sustainable development and, for many represent the gravest of threats to their survival and viability, including for some the loss of territory.
>
> (United Nations, 2014, p. 11)

Sea level rise places approximately 70% of the Caribbean population living along the coastal areas at risk of disasters threatening the functioning and existence of the Caribbean civilisation (Hauer, M.E et al., 2021). The SAMOA Pathway further emphasised the need for actions to address the developmental challenges faced by SIDS and the issue of the rising levels of GHGs in the atmosphere. Actions were geared towards the need for adaptation measures to be given global priority and supported by plans, policies, strategies, a legislative framework, and funding support (United Nations, 2014).

The midterm review of the SAMOA Pathway identified some progress, but the gaps and challenges seem to outweigh the advances that are yet to be realised in financing and financial growth and stability, innovation and technology, research and data collection, and disaster risk reduction and climate change resilience (United Nations, 2019; Gomes and Chase, 2014). Despite all the appeals and efforts, 20 years on the fourth SIDS conference, Antigua and Barbuda, 2024 considers climate change as a serious threat with widespread, rapid, and adverse impacts and increasing risks to SIDS. More so the limit of 1.5°C temperature rise by 2030 seems far less achievable than before efforts were put in place to curb the increase. The next conference is expected to convene in ten years, and there are concerns that some SIDS may no longer exist then.

How many more SIDS conferences will it take for this special group of countries to realise significant progress towards addressing climate change, sea level rise, and other related challenges? Scobie (2022) tabled the concern that repeated climate conferences have failed to link impact, liability and compensation, and the lack of an agreement on loss and damage finance facility to help vulnerable countries address the consequences of climate change. More importantly, it leaves the question,

> How relevant will be climate funding if land lost to the sea are no longer accessible and how much money will be enough to compensate for the constant loss due to extreme weather, the uncertain and ongoing health crisis and loss of lives and livelihoods?

Is the limit of 1.5°C increase in temperature still relevant, or is it already too late for SIDS? What needs to be done to be able to report better results on programmes of action from the various SIDS conferences? How do we really save SIDS from rising sea levels and other climate impacts? These are real questions that many people in SIDS are hoping will be answered, but for now the reality of climate change is being experienced in SIDS in the Caribbean.

Climate Change: Impacts in the Caribbean Region

Climate change is already affecting SIDS in the Caribbean, where the mean surface temperature has increased by 1°C, over preindustrial times. It is projected to increase by 2.8°C, across the region by 2070, if enough is not done to slow down the rate of increase (Simpson et al., 2012). According to the heat outlook for the Caribbean, near-record heat is expected in the Caribbean from May to October 2024, with specific concern for the period August to September (Van Meerbeeck and Reid, 2024). Forecast of intense near-record night time and daytime heat with increasing humidity is projected from June to September 2024 (Van Meerbeeck and Reid, 2024). Frequent likely

intense and possibly persistent episodes of heat stress in the vulnerable population and small livestock are expected due to high temperature and increasing humidity through September 2024 (Van Meerbeeck and Reid, 2024).

The region's population, already vulnerable due to the socio-economic challenges and exposure to hazard over the last few years, are prone to increased health risk, especially for manual workers, the elderly, and children, economic losses especially on agriculture and fisheries; and the domino effect on the socio-economic systems. The Caribbean Region has seen an increase in the frequency and intensity of storms and hurricanes, longer drought, salinisation of freshwater, and loss of habitat and livelihood exacerbated due to the impact of climate change. In 2017, three hurricanes and a tropical storm wreaked havoc in several Caribbean Islands, with Hurricane Irma alone responsible for damage or destruction of 95% properties in Barbuda (Taylor, 2021). Early in the 2024 hurricane season on 1st July, Hurricane Beryl, the earliest category 5 on record, caused devastation in St Vincent and the Grenadines and neighbouring islands as a category 4 hurricane. Planning for these uncertainties poses a challenge for SIDS that are constantly in recovery from one event to the next.

Impacts from sea level rise are also expected to continue to affect the Caribbean region, exposing coastal infrastructure, coastal population, and the economic sector which depend on coastal amenities. Furthermore, the marine environment will be exposed to ocean warming and acidification, affecting coral reefs, fish stock, and other marine life. The conch, which is a special part of the Caribbean seafood diet, is also threatened. In addition, the quality and quantity of surface and groundwater systems are at risk of being compromised due to changes in rainfall pattern and saltwater intrusion (PAHO, 2019). This has implications for agriculture and food security. Challenges will also arise from ocean warming and acidification, which will impact coastal ecosystems such as mangroves and coral reefs and other marine life that are critical to livelihoods in the Caribbean (PAHO, 2019).

The region also experienced an increase in infectious diseases such as dengue and other health risks (Scobie, 2022). The vectors of such diseases can flourish due to increased temperature or after storm events, where there is the likelihood of much standing water. Climate change also affects the delivery of health services since many healthcare facilities are located near coastal areas prone to tropical cyclones, floods, storms, and related disturbances in water supplies. Damage to infrastructure and essential amenities affects the capacity of health systems to provide services when they are most needed in emergency situations. In addition, the number of persons killed or injured during extreme events is increasing.

SIDS have long recognised the impact of climate and health and have been proactive in taking action. Their concerns were highlighted at a workshop in Samoa in 2000 and followed up by a conference in Barbados in 2002 and the Maldives in 2003 (PAHO, 2019). The Caribbean region has been

proactive in addressing the impact of climate change through the establishment of the Caribbean Community Climate Change Centre (5Cs) in Belize in 2004, which has helped to drive initiatives on climate change and variability impact, data collection, and special programmes to address the adverse effects of climate change and related issues (PAHO, 2019). Other agencies that provide research and initiatives to support climate change in the Caribbean region include PAHO, Caribbean Public Health Agency (CARPHA), and the University of the West Indies (UWI). As part of the 'Caribbean Climate Change and Human Health' workshop, a road map for advancing climate change and health actions in the Caribbean was developed. In 2015, CARPHA and PAHO organised the Caribbean Environmental Health Conference.

Additionally, the PAHO's Smart Hospitals programme was implemented to ensure that healthcare facilities continue operations during disasters, focusing on improving hospitals' resilience, strengthening structural and operational aspects, and providing green technologies to reduce energy consumption, waste generation, and the carbon footprint (PAHO, 2019).

Climate Change and Saint Vincent and the Grenadines

To elaborate on the key points, this chapter will use the case of Saint Vincent and the Grenadines, a multi-island state in the Eastern Caribbean consisting of 32 islands and cays. The closest island neighbours include St Lucia located 25 miles North, Grenada located 75 miles South, and Barbados 100 miles East. SVG has a total land area of 389 sq. km/150 sq. miles and is located 13° 15′N and 61° 15′W. This places the country in the Atlantic Hurricane belt with a designated season for tropical cyclones that can also occur outside of that season. Mainland St Vincent is 344 sq. km/133 sq. miles while the Grenadines combined covers a total land area of 45 sq. km/17 sq. miles.

St Vincent is characterised by volcanic features with a central mountain that stretches from the La Soufriere in the north, 4,048 ft/1,234 m high, down to St. Andrews Mountain 736 m in the south. The leeward side of the island is marked with dissected ridges and valleys extending to the edge of the water, while the windward side is gently sloping with an almost straight coastline. The Grenadines on the other hand are predominantly lower lying, remnants of an older volcanic nature than St Vincent. They bear the characteristics of white sandy beaches, crystalline blue water, and bright coral reefs (Fielding and DeGraff Ollivierre, 2017). The lack of surface water on the islands means that they experience shortage of freshwater throughout the year. The recent experiences of prolonged dry season make it critical for sustainable water management systems to be developed on these smaller islands. The traditional means of delivering water from the mainland during the dry season is no longer sustainable especially post impact from Hurricane Beryl. Hurricane Beryl damaged or destroyed close to 100% homes of some of the southern Grenadines destroying household water catchment systems in the process.

SVG has a humid tropical climate, with relatively constant temperatures and an annual average of 26.7°C (81°F). The precipitation range from 1,700 mm to 7,000 mm. The population of SVG is approximately 110, 418 (Government of St Vincent and the Grenadines, 2022), with more than a quarter settling in Kingstown, the capital, and the suburbs resulting in rapid urbanisation and the associated social problems. In SVG, most of the development and settlement is located on a narrow coastal strip less than 5 m above sea level and less than 5 km from the high-water mark. This accounts for the location of about 85% of the population, 80% of the infrastructure, and 90% of economic activity (Simpson et al., 2012). The economy of St Vincent and the Grenadines is based largely on agriculture, which contributes about (CARDI, 2024) 7% of GDP and 26% of the labour force.

The unique and remarkable topographic features of Saint Vincent and the Grenadines, which make it attractive for tourism as a main source of economic activity, are some of the same features vulnerable to climate change and sea level rise. Over the last 15 years, SVG experienced impacts from a wide range of hazards including hurricanes and storms, the most notable includes Hurricane Dean 2007, Omar 2008, Tomas 2010, Tropical Storm Matthew 2016, Hurricane Elsa 2021, Hurricane Bret 2023, and the devastating Hurricane Beryl 2024. In recent years, the island state also experienced damaging flood events. The most remembered is the December 2013 event and the April 2011 impact. There were destructive troughs in 2016 and several in September and November 2023.

Following devastation from drought of 2009, the island was impacted by Tomas in 2010, resulting in about EC$35 million in losses mainly to banana and plantain (Government of SVG, 2019) in addition to the loss in other sectors that amounted to about EC$35 million. The April 2011 floods and landslides affected agriculture in the some of the same areas affected in 2010. Already in the 2024 hurricane season, Hurricane Beryl impacted SVG as a Category 4, devastating the country and completely flattening some of the Grenadine islands. The damage and loss is expected to surpass other disaster damage in our historical records.

The volcano, after 40 years of dormancy and a brief period of effusive eruption, violently erupted in April 2021. Other significant events include drought, transport accidents, and a series of vector-borne illnesses, including Chikungunya (ChicV) 2014, Zika, and Dengue Fever outbreaks in 2020 and 2024. The island also suffered at the hands of the COVID-19 pandemic from March 2020 and ongoing, this resulted in the loss of lives and livelihoods and other socio-economic challenges for the people of SVG. Based on the climate change risk profile of St Vincent and the Grenadines, the impact of climate change will get worse (Simpson et al., 2012), SVG seems to be facing the worse of climate change-related impacts. The risk factors include increasing ocean and atmospheric temperature; rainfall decrease; sea level rise; extreme events such as intense heat, drought, and stronger hurricanes; health; and pollution.

Temperature – Atmospheric – Sea Surface

An increase in the average atmospheric temperature with a projection of 2.4°C–3.0°C mean annual temperature by 2080 was predicted in SVG's risk profile. Recent trends indicate increasing temperatures. The local Met Office reported that three of the last ten years have been the hottest on record for SVG (Jeffers and Cato, 2024).

The year 2023 was designated as the warmest year on record surpassing the 2016 and 2020 records. In 2023, there was also a record high of 25 consecutive days, between 2nd and 26th September, when the mean maximum temperature of 31.3°C was exceeded (Jeffers and Cato, 2024). In October of the same year, a mean maximum temperature of 31.6°C was recorded, and there were 26 days when the mean maximum temperature of 31.1°C was exceeded (Jeffers and Cato, 2024). As a result of the record-breaking temperatures, the human population was affected, especially the most vulnerable children and the elderly (Jeffers and Cato, 2024). In addition, agriculture, especially vegetables, poultry, and livestock were impacted.

It is predicted that warmer-than-average day and night temperatures will continue, and the population is already complaining of the effects. Excessive heat is also predicted, possibly record-breaking from August to October 2024. Multiple impacts of heat stress have already been observed in the human populations as well as in crops, poultry, and livestock (Jeffers and Cato, 2024). Increased temperature, reduction in rainfall, and sea level rise can have serious implications for the agricultural sector, including poor yields from crops, loss of livestock, and increased impact of pest and diseases on produce. The domino effect is a shortage of food, rising food prices, and the unaffordability of food and poor nutrition (Simpson et al., 2012).

Rainfall

In SVG, precipitation decreased by 8.2 mm (−5.7%) per decade since 1960. It is projected that there will be an overall decrease in rainfall of between 22 mm and 30 mm by 2080 (Simpson et al., 2012). On average, SVG receives 2,154 mm or 84.8 inches of rain; in 2023, there was an overall deficit of 22.9% and in 2022 a deficit of 30.7% (Jeffers and Cato, 2024). In general, there is a reported decrease in rainfall over the last decade (2013–2022) in SVG. While there is a general reduction in rainfall, there may be periods of intense rain over a short time which can result in secondary impacts including landslides and flooding and effects on the local water catchment.

The historical records for SVG indicate that three of the top five driest years occurred in the last decade (Jeffers and Cato, 2024). In recent years, there have been several drought events, with 2022 recorded as the driest year on record recording 1,491.1 mm (58.7 inches) of rainfall (Jeffers and Cato, 2024). In the last few years, SVG has seen water rationing in some areas by the water management agency, Central Water and Sewerage Authority (CWSA). Reduced

rain means less water for harvesting and distribution to the population and limited water for agricultural production. The Grenadines are particularly vulnerable as they depend mainly on rainwater for household and other needs. Despite the reduced rain, it is expected that there will be an above-average tropical cyclone activity across the Atlantic Basin in 2024, which can be devastating especially following a period of drought. Already early in the season, on 1 July 2024, Hurricane Beryl has caused severe destruction on SVG and neighbouring islands.

Water shortage has serious implications for food production and food security. In 2009, water shortage seriously impacted farming in Georgetown, resulting in loss to farmers, reducing crop production, increase food prices, food shortage, and increase in importation (Government of SVG, 2019). The Ministry of Agriculture in SVG is putting measures in place to address the impact of drought and water scarcity on farming. One such initiative includes the assessment of farms across the country to determine how the drought condition has impacted farmers and their farms (NBC Radio, 2024a). The Ministry of Agriculture also secured over 300 drip irrigation kits to support farmers against drought and water scarcity and boost efficiency. The farmers will be trained to install and use the systems effectively (NBC Radio Website, May30 2024b; NBC Radio, 2024).

Sea Level Rise

Climate change is contributing to sea level rise, a 1 m to 2 m sea level rise increases the risk to coastal development. Most of the development in SVG is located on a narrow strip of coastal plain, since most of the interior is mountainous. As such about 10% to 24% of major tourism properties, 1% road network, 50% to 75% airport lands, and 67% seaport lands are vulnerable to the impact of sea level rise (Simpson et al., 2012). Erosion and loss of tourism resorts, turtle nesting sites, and other coral assets are at risk to sea level rise, including beach loss at strategic locations such as Belmont, Bequia & Indian Bay, St Vincent. Critical infrastructure, settlement, and development are exposed and often impacted by coastal hazards (Simpson et al., 2012). The exposure of coastal development to sea level rise increases the vulnerability of already-susceptible areas and threatens the sustainable development of SVG. Sea level rise and storm surges contribute to river flooding and damage to livelihood systems and protective ecosystems. Low-lying settlements may become unviable and can result in the need for relocation of entire coastal settlements and loss of infrastructure.

Other Climate Change-Related Impacts

SVG has experienced droughts, storms, and hurricanes in the past; however, the frequency and intensity on a society that is unprepared or already overwhelmed with responding to hazards is what causes disasters. Increase in dry

conditions and drought result in serious setbacks for various sectors and the population. Dry conditions contribute to land degradation, losses in agricultural production, increased exposure to wildfires, and cascading hazards from rainfall events. Agricultural losses, including reduced production, poor quality produce, and death of livestock, affect farmers whose livelihoods depend solely on agricultural production. It further contributes to food insecurity and increase in importation and potential for increase in malnutrition and food-borne diseases. Furthermore, this may also result in the abandonment of farming and increase in urbanisation to look for alternative means of earning a living.

Climate Change and Health in SVG

Climate change influences the social and environmental determinants of health, such as clean air and safe drinking water, sufficient food, and adequate shelter (Nichols, 2018), and increases vulnerability to disastrous outcomes (Pan American Health Organisation, 2019). Although all populations are at risk, some are more vulnerable than others.

Despite the strong mandates, and the clear agenda for implementation, the international response remains weak, for both health in general and SIDS in particular. Less than 1.5% of international finance for climate change adaptation is currently allocated to health projects. The health sector is affected by climate-sensitive diseases and other related issues that affect health, including temperature-related morbidity and mortality, since some causes of death are exacerbated by heat (Government of SVG, 2019)

Thermal Stress Related to Climate Change

High temperatures raise the levels of ozone and other pollutants that aggravate cardiovascular and respiratory diseases (Nichols, 2018). It is predicted that there will be more hot days in 2024, and this poses a great risk to the most vulnerable in the population, especially the very young, the elderly, and those with chronic illness or otherwise high risks. Extreme heat also increases pollen and aeroallergen levels which also trigger asthma (Nichols, 2018). In addition to the normal health issues, climate related-health risk can be overwhelming on the health system.

Too much or too little water contributes to the changes in the pattern of spread of infectious diseases. In some instances, there is the lengthening transmission seasons of vector-borne diseases. Dengue fever is endemic to SVG, with recent outbreaks in 2020 and 2024. As mosquitos expand their range, they introduce diseases to new areas which inevitably leads to increasing the range of transmission. According to the NAP 2019, leptospirosis infection spread is aligned with periods of impact by storms or hurricanes – 2002, 2004,

2005, 2007 (Government of SVG, 2019). Extreme heat also affects healthcare in other ways, including the condition of storage of medications. Waterborne diseases outbreaks exhibit a positive correlation with excessive precipitation events (Nichols, 2018, p. 2).

Air Pollution

There has been an increase in the incidence of Sahara dust in the atmosphere. The Ministry of Health reported an increase in the number of patients with respiratory ailments. In the advisory, the Ministry of Health noted that the Sahara dust reaches the Caribbean from the Sahara Desert all year round but is more prevalent between February and October. Dust can seriously affect health and can be fatal.

According to the Met Office, long-term prediction of Sahara dust is not possible and can be forecasted only for a few days. As a result, it is difficult for some people to adequately prepare, especially since the coverage can persist for several days. Climate change and the effect on SVG cannot be fully determined, especially without the necessary data to make certain projections, but the experience of recent years provides some basis to understand the changing nature of climate. Climate change and disasters have the potential to significantly affect the wellbeing and health of the most vulnerable, including the poor, elderly, disabled, women, children, and those who are already at risk disproportionately.

Vulnerable communities become more vulnerable, especially when their livelihoods are impacted. Livelihood can be lost due to the impact of drought, storm, hurricanes, and weather-related events. Job loss can result in the inability to finance socio-economic needs and accessing health services and the inability to respond, cope, and recover from the impact of hazard, which can lead to disasters. This situation creates dual burdens – both on individuals and on the state's obligation to ensure citizen welfare. This includes addressing issues of poor health, both physical and mental, high employment, and recovery from disasters.

Strategies for Mitigation and Adaptation

Mitigation and adaptation are not options to be delayed, they are urgent priorities that should be quickly advanced. Mitigation is strengthening human and natural systems to withstand the effects of climate change. Adaptation is reducing human impact on the climate system. Adaptation can help to moderate the impact of climate change on society. Those countries that contribute less to climate are most impacted but are also the most proactive. The Caribbean contributes less than 1% but has been collaborating with development agencies to bring attention to climate change and promoted mitigation and

adaptation measures. Several conferences, workshops, and activities have been undertaken across the Caribbean to build capacity, share knowledge, and guide actions on climate change in the region. Some of the actions and activities undertaken in SVG include:

- Sector policies and plans – agriculture, tourism, disaster management, energy, and others
- Renewable energy exploration
- Climate modelling
- National Action Plans for Climate Change
- Institutional capacity building/strengthening
- Increase research
- Curriculum programmes

Many of the strategies are undertaken at the institutional level with a few at the grassroots level. Adaptation measures need to empower people to cope with and recover from the impacts of climate change and adjusting to life in a changing climatic environment. Mitigation would require efforts to reduce GHG emissions by limiting activities that produce GHGs and increasing carbon sinks to remove GHGs from the atmosphere. Effective mitigation measures can benefit from the following:

- A robust youth programme to engage and equip young people with the knowledge, skills, and opportunities to play an active role in shaping their future with climate change. More community-oriented assessment, advocacy, and action to mitigate and adapt to climate change and related-health issues.
- An ongoing education and awareness programme to foster a climate change culture, including environment protection and preservation – pollution, deforestation, water and energy use, mosquito breeding, drain maintenance, and health. The SVG DRR and climate change curriculum presents an opportunity to ensure that every child who passes through the education system is exposed to knowledge and action on climate change.

SIDS need financial support to mitigate and adapt, but money alone is not enough to mitigate against less than 1%; the countries that contribute the most must do more to reduce emissions – an ounce of prevention is still better than a pound of cure.

There is need for more data-driven assessment to better examine how inequalities increase the risk of marginalised communities to disasters and climate change- related health risk. Poor and marginalised communities generally have strong bonds which work well to address issues affecting the community, but such bonds also can be a barrier to effect change, this is considered a double bind. Therefore, working closely with communities can help

to open pathways to effective strategies to address social issues affecting the communities (Ferdinand et al., 2012).

From a social science perspective, this chapter highlights the intersectionality of vulnerability in SIDS. It also emphasises on the fact that vulnerability to climate change is not simply an environmental issue but is deeply embedded in historical, political, and socio-economic structures. SIDS, despite their negligible contribution to global GHG emissions, disproportionately suffer the consequences of climate change. This imbalance underscores the broader structural inequalities within the global economic and environmental system, reflecting the legacies of colonial exploitation and continued economic dependence on high-emission industrial nations.

This chapter critiques the socio-economic disparities that make poorer communities more susceptible to climate-related disasters. The argument that poverty and uneven development aggravate disaster-related health risks aligns with broader sociological and anthropological research on environmental justice. Vulnerability in this context is not solely about exposure to environmental hazards but also about access to resources, political representation, and economic resilience. The chapter discusses various mitigation and adaptation strategies undertaken at institutional levels, noting that many efforts remain top-down and fail to incorporate grassroots participation. This observation aligns with other critiques of climate governance, which argue that decision-making processes are often dominated by technocratic and Western-centric frameworks. The chapter's emphasis on the exclusion of local communities from climate policy decisions echoes concerns raised by scholars such as Campbell and Barnett (2010), who argue that adaptation strategies should integrate Indigenous knowledge and local governance structures rather than rely solely on external expertise.

The emphasis on international collaboration and policymaking also raises important questions about climate justice and the role of the Commonwealth. While the Commonwealth framework provides a historical and political context for shared responsibility, it has also been criticised for perpetuating asymmetrical power relations between former colonial powers and Global South nations. Financial assistance and climate funds are necessary but insufficient unless accompanied by genuine shifts in power dynamics that allow SIDS to shape their own climate resilience strategies. A key insight in the chapter is the dual role of community bonds in both facilitating and hindering adaptation to climate change. The concept of the 'double bind' – where strong communal ties enhance resilience but can also resist necessary changes – offers a valuable sociological perspective on disaster response. In many SIDS, informal networks of care and mutual aid play crucial roles in disaster recovery, often compensating for the inadequacies of formal state interventions. However, deeply ingrained social norms and traditional livelihoods may also make communities resistant to externally driven adaptation measures. This dynamic suggests that successful climate adaptation must go

beyond infrastructural and economic solutions to engage with the cultural and social dimensions of resilience. The call for more community-oriented assessment and action aligns with participatory research methodologies that advocate for co-producing knowledge with local populations rather than imposing external solutions.

This chapter's discussion of climate change as both a cause and consequence of health disparities reflects broader debates within political economy. Climate-induced health risks in SIDS – such as vector-borne diseases, malnutrition, and mental health stressors – cannot be separated from global economic structures that determine access to healthcare and social services. The reliance of many island nations on tourism, remittances, and external aid creates economic fragility that is intensified by climate shocks. The chapter's critique of the responsibility of major GHG contributors is in sync with the principle of 'climate debt', which posits that industrialised nations owe reparations to the Global South for the environmental harm caused by centuries of extractive economic practices. The call for financial support for mitigation and adaptation in SIDS is not merely an economic necessity but a moral imperative rooted in historical accountability.

In Conclusion

This chapter set out to review publications on disaster, climate change, and related-health impacts and experiences in Saint Vincent and the Grenadines to identify relationships and concerns. The aim was to understand the impacts of climate change on the health of populations that are living in SIDS by analysing the case of SVG. Climate change is wreaking havoc on farms, forests, fisheries, housing, infrastructure, and communities in SVG. A series of overlapping catastrophes has affected the state in recent years, which underscores the devastating impact of the climate crisis on SIDS. The climate impacts are expected to worsen in the future. As such, all sectors should implement plans to absorb and recover from future events. Similar to other SIDS, SVG contributes very little to GHG emissions but face serious repercussions from the impact of climate change. If climate change mitigation is delayed, we would lose track of its domino effects, which would make adaptation measures ineffective. As the adage suggests, 'an ounce of prevention is still better than a pound of cure' – proactive and equitable climate policies are essential to safeguarding the future of vulnerable island nations.

In global platforms, there are a lot of discussions and debates on the severe financial and infrastructure impacts of the climate crisis on SIDS. However, the links between the climate crisis and health, especially from a SIDS perspective, are yet to become strong. Further, Allen et al. (2021) point out that addressing health risks from the climate crisis of SIDS needs a strong global commitment and investment in institutional capacity building as well as a deeper policy and

practice understanding of health and environmental outcomes. It is important to understand that SIDS are socially, economically, and environmentally vulnerable to the climate crisis. However, their contribution to global GHGs is negligible. There is enough evidence that the climate crisis can very easily destroy SIDS. This means that concentrated multisectoral efforts to build the resilience of SIDS are needed at local, regional, and global levels.

In conclusion, it is important to remember that dealing with the climate crisis is an existential problem for the human population globally. However, from the standpoint of SIDS, we are facing a grave and urgent existential crisis. Health risks in this regard must be understood within existing conditions but also with a future perspective. While SIDS are experiencing the heavy burden of the climate crisis, they are also at the forefront of finding solutions. Many SIDS have made strong political commitments to a net-zero, climate-resilient future. These include highly ambitious national action plans. At the COP29 in Azerbaijan (2024), it became clearer that health must be at the heart of climate solutions. What does this mean? Each and every single country is affected by the climate crisis, and each and every single human being is responsible to find and implement solutions to this crisis. In that, many 'developed' and larger countries must learn from the SIDS that are taking positive and necessary actions to ensure that human population continue on this planet for a long time. In that, the current global development agenda, including the sustainable development goals (SDGs), has to be reviewed and re-evaluated to ensure that human population is pushed to establish harmonious relationship with nature. Health in this regard must be examined, understood, and facilitated among populations, not only in SIDS but globally.

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6 Conclusion

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This book presents a unique perspective, particularly from interdisciplinary and multidisciplinary perspectives. We all come from different disciplinary trainings – history, anthropology, sociology, and human geography – and are aware of the positionalities and politics implicated in this work. A comparative analysis of the UK, Sri Lanka, and Saint Vincent and the Grenadines has never been done before – at least in the context of island states facing climate change, disasters, and health risks. This book is grounded in literature, lived experiences, and thoughtful reflection as human beings. Consequently, the approach to the chapters of this book cannot be dedicated to one discipline but a range of disciplinary approaches.

Chapter 2 establishes critical definitions related to climate change, disasters, and health risks. It argues that humanity is facing a grave existential crisis that necessitates rethinking, reevaluating, and reshaping our social, political, cultural, economic, and environmental practices urgently. If the human population is to survive on this planet, all our practices including aspirations for "development" must be critically examined. This does not imply opposition to development; rather, it emphasises the need to transform our predominant ways of living, which are often rooted in greed, arrogance, and exclusivity, into practices based on contentment, humility, and inclusivity. As human beings, we must change and relearn how to live harmoniously with ourselves, each other, and nature at large. Chapter 3 investigates environmental racism and its role in creating climate-induced health risks in the UK. Once a powerful empire, the UK continues to exhibit colonial practices, and it is high time to transform its social, political, cultural, economic, and environmental structures to promote contentment, humility, and inclusivity. Such transformation would require the elimination of outdated policies and practices to establish new ones. This means to have faith and commitment towards social justice, which is currently lacking in the UK. Chapter 4 discusses the present and future challenges posed to human health by climate chaos in Sri Lanka. The ongoing social, political, economic, cultural, and environment crises in this island have completely ignored the climate crisis as a human existential catastrophe. This chapter point towards the urgent

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need to establish an inclusive discourse on climate-induced human health challenges within a development approach that can facilitate harmonious relationship between humans and nature. Chapter 5 examines the impact of climate-driven disasters on human health in Saint Vincent and the Grenadines. Being a Small Island Developing State (SIDS), the socio-economic challenges to human populations create further health risks in Saint Vincent and the Grenadines. This chapter point towards the fact that SIDS are taking the brunt of the climate crisis, however, they are also at the forefront of finding solutions. There is valuable opportunity for the global community to learn from SIDS in finding solutions to climate change, disasters, and health risks.

This book serves as one of the first works to emphasise the significance of interdisciplinary and multidisciplinary approaches to examining climate change, disasters, and health risks in the context of island states. While acknowledging the importance of both overarching (bird's-eye view) and detailed (worm's eye view) perspectives, we also emphasise the importance of understanding these problems from various other angles. Understanding the climate crisis requires an exploration of all possible perspectives. The single-discipline analysis offered by the scientific perspective cannot deal with the crisis at hand. That is why we argue that all different epistemologies, philosophies, and approaches must be engaged in a discourse to find solutions. The historical perspectives in this book are not to instigate resentment but to facilitate a rethinking of our present and future as human beings on this planet. As an ancient Asian proverb states – *if one indulges in the past, they lose the present, but if they ignore the past, then they lose the future*.

As we near the completion of this book, we wish to remind ourselves and readers that this does not provide all the solutions to climate change, disasters, and health risks in the context of island states. Rather, this book serves as a tool to initiate two types of discourse. The first is a deconstructive discourse, emphasising the need to critically analyse our ways of living, along with our social, political, cultural, economic, and environmental systems and structures. Affected by coloniality, modernity, and violence against nature, our systems require scrutiny and reflection beyond mainstream knowledge, policies, and practices. Instead of adhering to definitive interpretations of ideas, concepts, and philosophies, we must consider multiple possible meanings, which, in turn, can lead to transformative change. Construction is built upon deconstruction. The development of ideas, approaches, and practices must be grounded on contentment, humility, and inclusivity – qualities that are inherently interconnected. This constructive discourse involves a wide range of epistemologies, philosophies, and approaches from all corners of this planet. They could be from academic domains, community domains, or tribal domains regardless of their mainstream acceptance. As we have discussed throughout this book, the climate crisis is an existential one, and we need all the help we can garner to survive on this planet.

As we write this conclusion, we reflect on the recent destruction of the 7.7 magnitude earthquake in Myanmar on March 29, 2025. This reminds us of the fragility of human life and human-centric structures and systems. This is a reminder that no matter we attempt to dominate and control, we – as a human species – are governed by nature and natural processes. Until this realisation, human population will remain a confused and frustrated collective driven by greed, arrogance, and exclusivity, heading towards potential extinction. Our survival hinges not on individual efforts from specific countries or people; rather, it requires a united collective effort for the survival of all. In this context, divisions based on ethnicity, race, geography, religion, and power become meaningless.

Many scientists and social scientists do not subscribe to the idea that human population as a whole is facing an existential problem. Instead, they argue that depending on where people live is a determinant of this existential threat. For those living in island nations, the coastal plains of Bangladesh, or the Sahel region, the prospects may include retreating or abandoning their homelands. They assert that this represents an existential threat to those populations but not to everyone. This aligns with the argument of this book about the divisions among people, such as "us vs. them" or "rich vs. poor." If these divisions persist, humanity will struggle to take the necessary actions to mitigate the crisis. Moreover, there are scientific and political arguments that a significant threat looms for many individuals worldwide who have little control over future climate change. From a scientific perspective, which relies on linear analyses, this division appears rational, suggesting that some individuals possess "control" over the future. However, as previously noted, science and scientists are a production of societies they live and are influenced by political, cultural, economic, and environmental realities in their contexts. On the surface, what seems to be valid needs a deeper examination – a narrative that divides the people who are impoverished individuals in the Global South as facing an existential crisis while people based in the Global North need not be concerned. This is the key problem that we address throughout this book: human inability to live in harmony with themselves, each other, and nature.

Further reinforcing our argument, Hoesung Lee, Chair of the IPCC, has emphasised that climate change has become a crisis due to inaction and is increasingly threatening human wellbeing and the health of our planet.[1] This situation calls for us to view ourselves as one species rather than through the lenses of race, ethnicity, geography, religion, and other divisions. We must also recognise our interconnectedness with all living beings and non-living elements on Earth. Ancient philosophies, beyond the confines of Euro-North American modernity, have long understood this interconnectedness. For instance, the ancient Tao philosophy from China posits that both the planet and humanity share the same origin, structure, and governing laws. This realisation about our interconnectedness is crucial for fostering inclusive human life. Similarly, the Bhagavad Gita, a significant text in ancient Hindu

philosophy, asserts that the grace of nature governs all human activity. Nurturing a harmonious relationship between humanity and nature is essential for our survival on this planet.

We do not dismiss the realities of uneven development and poverty that create vulnerabilities among different groups, including women, children, and tribal populations. The experiences of climate change, disasters, and health risks vary significantly based on factors such as gender, age, sexuality, class, caste, political affiliation, and religious beliefs. This understanding underscores why this book – particularly in Chapters 3, 4, and 5 – emphasises the need for social justice, inclusive dialogue, and learning from all perspectives. This book is located within the Caribbean, Europe, and Asia; however, the points we are raising in this book are relevant to everyone on this planet. Most countries in Africa, North America, and West Asia (or the Middle East from a Euro-North American standpoint) are experiencing the impacts of climate change and disasters and experiencing numerous health risks. To deal with a global challenge due to the climate crisis, we all must collaborate as equal partners to improve the conditions of all living beings and non-living forms on this planet.

Note

1 See: https://www.ipcc.ch/2022/02/28/pr-wgii-ar6/

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