



Comprehensive Climate Change and Health-National Adaptation Plan (C3HNAP)

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Developed by

**Climate Change and Health Promotion Unit (CCHPU)
Health Services Division
Ministry of Health and Family Welfare**



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Government of the People's Republic of Bangladesh**

Forward

Bangladesh is among the most vulnerable countries in the world facing the effects of climate change, stands 7th in the 2021 German Climate Index among the most vulnerable due to climate change. Moreover, impact of climate change and variability is and will continue to have implication on public health in Bangladesh in diverse and numerous ways. Through both direct and indirect pathways increasing temperatures, shifting rainfall patterns and irregular rain, sea-level rise, ocean acidification and increasing frequency and intensity of extreme weather events, including cyclones, flooding, and drought are threatening the health and well-being of millions of Bangladeshis, often with the most vulnerable populations facing the greatest risk.

These climatic impacts are driving and exacerbating the burden of various health outcomes including: increased risk of vector-borne diseases, such as malaria, chikungunya, Japanese encephalitis and dengue; water-borne and water-related diseases, such as cholera and other diarrhoeal diseases; under-nutrition due to climate-related impacts on agriculture production; as well as deaths and injuries due to increased number of natural disasters.

In order to ensure the physical, mental, and social well-being of all people in Bangladesh the resilience of individuals, communities, and the health system must be strengthened to adapt to climate change. This includes such actions as increasing the awareness of the health risks of climate change, promoting community-based health adaptation, building the capacity of the healthcare workforce, and climate-proofing healthcare facilities and infrastructure, among others.

The Bangladesh Health-National Adaptation Plan (C3HNAP) will aim to guide the health sector over the next five years and beyond by building on existing national health adaptation to climate change efforts, as well as promote the integration of climate change and health risks into national health policies, planning, programming, and monitoring strategies. The C3HNAP will also align with national climate change adaptation processes, including the National Adaptation Plan (NAP), to support coordination across relevant sectors and with key stakeholders.

In Glasgow, COP 26, there was declaration of COP26 Health program which declared two commitments to combat the impact of climate change on health. As a signatory of the 50 members parties who initiated COP 26 Health Program, Bangladesh is committed to implement the commitments through C3HNAP.

Commitment 1: Climate Resilient Health System

- Commit to conduct climate change and health vulnerability and adaptation assessments (V&As) at population level and/or health care facility level by a stated target date
- Commit to develop a health national adaptation plan informed by the health V&A, which forms part of the National Adaptation Plan to be published by a stated target date.
- Commit to use the V&A and C3HNAP to facilitate access to climate change funding for health (e.g., project proposals submitted to the Global Environmental Facility, Green Climate Fund, Adaptation Fund, or GCF Readiness programme)

Commitment 2: Sustainable Low Carbon Health System

- High ambition/high emitters: Commit to set a target date by which to achieve **health system net zero emissions**

- Commitment to deliver a **baseline assessment** of greenhouse gas emissions of the health system (including supply chains)
- Commit to develop an **action plan or roadmap** by a set date to develop a sustainable low carbon health system (including supply chains) which also considers human exposure to air pollution and the role the health sector can play in reducing exposure to air pollution through its activities and its actions.

The Ministry of Health and Family Welfare fully supports and advocates the use of this C3HNAP as a broad framework for health sector action toward adaptation to climate change under the purview of developing NAP. Although Bangladesh is vulnerable to the health effects of climate change, over the period of time Bangladesh has shown resilience. The hope is that this document will continue to build a strong foundation, through collaboration and partnership, for addressing the health risks of climate change in Bangladesh.

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Abbreviations and Acronyms

BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BMD	Bangladesh Meteorology Department
BNC	Bangladesh National Nutrition
CC&H	Climate Change and Health
CCHP	Climate Change and Health Promotion Unit
CSD	Climate-sensitive Diseases
CDC	Communicable Disease Control
DGHS	Directorate General of Health Services
EWS	Early-Warning System
GCF	Green Climate Fund
HNAF	National Adaptation Plan-Health
NPNSDP	Health Population, and Nutrition Sector Development Plan
INC	Initial National Contribution
ICMH	Institute of Child and Maternal Health
IEDCR	Institute of Epidemiology Diseases Control and Research
IPHN	Institute of Public Health Nutrition
INDC	Intended Nationally Determined Contributions
ICDDR-B	International Centre for Diarrhoeal Disease Research
LCD	Least Developed Countries
M&E	Monitoring and Evaluation
MoDMR	Ministry of Disaster Management and Relief
MoEFCC	Ministry of Environment, Forests and Climate Change
MoH&FW	Ministry of Health and Family Welfare
MOU	Memorandum of understanding
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NDMC	National Disaster Management Council
NIPSOM	National Institute of Preventative and Social Medicine
NNS	National Nutrition Services
NCD	Non-communicable Diseases
NCDC	Non-Communicable Disease Control
PHC	Primary Health Care
SDG	Sustainable Development Goals
SNC	Second National Communication
TOR	Terms of Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
V&A	Vulnerability and Adaptation
VBD	Vector-borne disease
WASH	Water, Sanitation, and Hygiene
WBD	Water-borne disease
WHO	World Health Organization

Definitions

Adaptation refers to the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate harm or exploit beneficial opportunities. In natural systems, human interventions may facilitate adjustment to expected climate and its effects. In public health, the analogous term is “prevention”.

Adaptive capacity is the ability of a system to adjust to climate change, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.

Climate change refers to any change in the climate over time, generally decades or longer, whether due to natural variability or as a result of human activity.

Climate variability refers to trends in variation in the mean state and other statistics of the climate on all temporal and spatial scales beyond that of individual weather events. Extreme weather (storms, extreme temperatures) and climate events (drought) are part of climate variability trends.

Climate-resilient health systems have the ability to anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stresses, so as to bring sustained improvements in population health, despite an unstable climate.

Climate-sensitive health outcome is any health outcome whose geographic range, incidence or intensity of transmission is directly or indirectly associated with weather or climate.

Climate-related risks are additional (exacerbated) risks that people and their livelihoods and assets face due to climate change. These risks can be direct, such as in exposure to more frequent heat waves or floods; or indirect, such as when a drought negatively impacts food supplies (and prices) and in effect livelihoods and nutrition.

Exposure is the amount of a factor to which a group or individual is exposed; sometimes contrasted with dose (the amount that enters or interacts with the organism). Exposures may be either beneficial or harmful. Exposure to climatic conditions that affect health is heavily influenced by location, socioeconomic conditions and human behavior.

Resilience is the capacity of a social-ecological system to cope with a hazardous event or disturbance, responding or reorganizing in ways that maintain its essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.

Vulnerability is the degree to which individuals and systems are susceptible to or unable to cope with adverse effects of climate change including climate variability and extremes. The vulnerability and coping capacity of particular populations to changing meteorological conditions and its human and social consequences is influenced by a variety of factors. These include biological factors, sociocultural factors and access to and control over resources.

Executive Summary

Bangladesh stands among the countries most vulnerable to the impacts of climate change due to its geographical position and socio-economic conditions. Country's health sector faces significant challenges posed by climate change, including increased incidences of vector-borne diseases, water-borne illnesses, and nutrition-related conditions due to altered agricultural outputs. Extreme weather events such as cyclones and floods exacerbate these challenges, directly impacting public health infrastructure and services. The document reviews historical and projected climate trends to tailor its strategies effectively.

An adaptation plan that addresses the health aspect of climate change had been proposed to be developed for the climate vulnerable countries through Nairobi Work Programme on Impact, Vulnerability and Adaptation by UNFCCC since 2016. Based on the work since then, through the leadership of Ministry of Health and Family Welfare (MOHFW), there has been significant development through multi-stakeholder consultation and other activities. The Comprehensive Climate Change and Health-National Adaptation Plan (C3HNAP) aims to strengthen the resilience of Bangladesh's health sector to better address and adapt to these changes. This executive summary provides an overview of the document, outlining its main components and strategies for enhancing health-related responses to climate variability.

The C3HNAP draws lessons from other countries' adaptation plans, incorporating best practices and avoiding past pitfalls. This global perspective ensures that the plan remains aligned with international standards and can benefit from worldwide knowledge in climate adaptation. This document was developed collaboratively by the Climate Change and Health Promotion Unit (CCHPU), various health and environmental stakeholders, and international partners such as the World Health Organization (WHO). The plan's overarching goal is to guide the health sector in creating a robust, adaptive framework capable of responding to current and future climate-related health challenges. Specific objectives include enhancing disease surveillance, improving public health infrastructure, and increasing community engagement in health adaptation strategies.

The C3HNAP Preferences and Strategy documents from Bangladesh highlight the country's commitment to enhancing its health sector's resilience against the adverse effects of climate change. Bangladesh has made significant strides in health achievements, but climate change threatens to undermine these gains. Recognizing the close link between health and climate change, the country prioritizes adaptation measures aimed at both addressing immediate health issues triggered by climate-related events and building a durable health infrastructure. Key adaptation preferences include enhancing disease surveillance systems across all levels—from local to national—to better manage climate-sensitive health risks such as vector-borne diseases, water-borne illnesses, and nutritional deficiencies due to agricultural impacts. There is also a strong emphasis on integrating climate change considerations into all aspects of health planning and service delivery, ensuring that health service providers are well-equipped to handle climate-related health challenges. Furthermore, the strategy highlights strengthening community-based health interventions, utilizing local knowledge and actions to adapt effectively to climate change. Special attention is given to the needs of vulnerable populations including women, children, the elderly, and disabled persons, focusing on reproductive and adolescent health. These efforts showcase a comprehensive approach designed to increase the adaptive capacity of the health sector and the resilience of the communities it serves.

The C3HNAP Strategy outlines a detailed roadmap for realizing these preferences through the development and implementation of climate-resilient health policies and programs. This involves revising existing health policies to include climate adaptation measures and creating new policies as necessary. Strengthening surveillance and early warning systems is prioritized to enable timely responses to health emergencies. Building capacity among health workers through targeted training programs and launching public education campaigns to increase awareness about climate change and its health impacts are also strategic objectives.

Investments in climate-resilient infrastructure, such as flood-resistant health facilities and ensuring access to clean water and sanitation at health centers, are other focal points. Additionally, the strategy underscores the importance of enhancing international collaborations to secure technical and financial resources needed to implement the C3HNAP, demonstrating Bangladesh's proactive approach in safeguarding its health sector against climate change.

The C3HNAP the strategic priorities of enhancing climate-resilient health systems and integrating climate change into national health policies. Implementation strategies focus on strengthening institutional capacities, leveraging technology, and enhancing inter-sectoral coordination. The plan also emphasizes the importance of sustainable financing mechanisms to support these initiatives. Based on documentation and practices of different stakeholders as well as lessons learned from other countries Health National Adaptation plans, this plan focuses on 10 Strategies which reflects position of Bangladesh as one of the signatories of COP26 Health Work Programme.

Integrating the current climate change policy documents like Nationally Determined Contribution (NDC) and National Adaptation Plan (2023-2050) along with Mujib Climate Prosperity Plan 2041 as well as Bangladesh Climate Change Strategic Action Plan 2009 into the development of a climate resilient health service system has been proposed as the core activities of this Comprehensive Climate Change Health National Adaptation Plan (C3HNAP).

A detailed Monitoring and Evaluation (M&E) framework accompanies the C3HNAP to track progress, identify areas for improvement, and ensure accountability. Regular reviews and updates to the plan are mandated to adapt to new scientific findings and shifts in the socio-economic landscape affected by climate change.

C3HNAP represents a comprehensive approach to integrating climate resilience into public health planning and response. It aligns with national development goals and international climate adaptation frameworks, aiming to safeguard and promote public health against the backdrop of an increasingly unpredictable climate. The success of this document will depend on continued governmental support, stakeholder engagement, and effective implementation of its strategic actions.

1 Introduction

1.1 Context

Climate change has emerged as one of the most significant challenges of the 21st century, impacting various aspects of human life, including mental health. Bangladesh, a low-lying country situated in South Asia, is particularly vulnerable to the adverse effects of climate change due to its geographical location and socio-economic conditions. As the effects of climate change intensify, Bangladeshis are experiencing a growing mental health crisis.

One of the primary concerns in Bangladesh is the increasing frequency and intensity of extreme weather events. Cyclones, floods, and rising sea levels have become more frequent and severe, leading to loss of lives, displacement, destruction of homes and infrastructure, and disruption of livelihoods. These traumatic events leave lasting psychological impacts on the affected communities, leading to an increase in anxiety, depression, post-traumatic stress disorder (PTSD), and other mental health disorders. The loss of homes, livelihoods, and loved ones due to climate-related disasters can trigger a profound sense of grief and helplessness among the affected populations. Displaced people often face uncertainty and struggle to rebuild their lives, which can contribute to chronic stress and psychological distress. Although some research has addressed these issues to some degree, the influence of climate change on prevalent mental health disorders like depression and anxiety has not received as much attention. This lack of extensive study is largely attributed to the stigma surrounding mental health in numerous developing regions, including Bangladesh.

The World Health Organization (WHO) reports that out of 95 countries surveyed, only 9 have incorporated mental health and psychosocial support into their national health and climate change plans. Following natural disasters, a report from the American Public Health Association reveals that up to 54% of adults and 45% of children experience depression. Additionally, a Yale Program on Climate Change Communication report from November 2019 found that 66% of respondents expressed at least some level of concern about climate change.

The economic impacts of droughts, especially for farmers, can lead to an increase in suicide rates. A 2018 study published in the journal *Nature* predicted that warmer temperatures could result in up to 40,000 additional suicides in the United States and Mexico by 2050. Furthermore, researchers from the University of Cambridge in 2022 found that extreme weather and climate events can exacerbate gender-based violence due to factors such as economic shock, social instability, enabling environments, and stress.

The Intergovernmental Panel on Climate Change (IPCC) acknowledged the significance of mental health in relation to climate change impacts in its Fifth Assessment Report (AR5) from 2014. The report specifically highlighted the mental health risks faced by vulnerable populations, including women, and emphasized the need for further research and attention to mental health consequences in susceptible communities.

According to the National Mental Health Survey 2019, approximately 17% of the adult population suffers from mental illness. This statistic underscores the importance of addressing mental health issues, particularly in the context of climate change and its potential impacts on vulnerable communities.

In recent primary research, different aspects of climate-induced mental health issues in Bangladesh have been investigated, emphasizing its significance as a subject of concern. Cyclones cause psychological harm, leading to the affected communities experiencing conditions such as post-

traumatic stress, anxiety, depression, and sleep disturbances. (Tasdik Hasan, Adhikary et al. 2020) Vulnerable individuals and families undergo significant distress when confronted with environmental shocks. The sheer magnitude of devastation and loss of life and loved ones during such events can be deeply traumatic and affects their mental health. (Akhter, Sarkar et al. 2015, Kabir and Khan 2017) The profound impact of losing homes, farmland, and livestock leads to overwhelming pressure, stress, and anxiety. Individuals often experience psychological reactions such as flashbacks and a persistent fear of facing similar disasters in the future, which closely resemble symptoms associated with post-traumatic stress disorder (PTSD) (Islam and Rashid 2012, Akhter, Sarkar et al. 2015). For instance, in waterlogged regions, mothers often live in constant dread of their children suddenly drowning or have haunting visions of their deceased children (Akhter, Sarkar et al. 2015).

Natural disasters have the potential to exacerbate existing traumas by compounding other psychological health issues individuals may already be facing (Kabir 2018). Moreover, the inability to work due to injuries sustained during such disasters can contribute to feelings of depression. For instance, in the aftermath of Cyclone Mora, young Bangladeshi women who suffered physical injuries were unable to work, which significantly increased their likelihood of experiencing depression. It has been observed that younger women are particularly susceptible to developing depression disorders due to absenteeism (Mamun, Huq et al. 2019). The overwhelming sense of helplessness and insecurity following cyclones can also lead to harmful behaviors, such as self-harm, suicidal thoughts, and even suicide attempts (Tasdik Hasan, Adhikary et al., 2020).

Gender roles become a significant source of societal and family tension following disasters (Azad, Hossain et al. 2013, Habiba, Abedin et al. 2014). Floods and cyclones place added burdens on women, increasing the time and effort required to fulfill their daily tasks. Water insecurity resulting from floods and salinification forces women to travel longer distances to access clean water for drinking and cooking. This extended travel consumes more time and depletes their energy, impacting their ability to attend to other essential household duties, such as preparing food. (Habiba, Abedin et al. 2014) Unfortunately, these challenges lead to further problems for women in disaster-affected areas. For instance, women who struggle to serve meals on time may face verbal and physical abuse from their husbands (Azad, Hossain et al. 2013, Habiba, Abedin et al. 2014). Additionally, when they need to ask their husbands for money to buy food, they might experience violence in response. The stress of having to borrow food from neighbors due to scarcity exacerbates their situation (Ferdous and Mallick 2019).

Furthermore, the loss of crops and agricultural productivity following disasters contributes to food scarcity, which, in turn, prompts women to eat less, leading to malnutrition and decreased energy levels. The consequences of these challenges go beyond physical well-being; they impact women's ability to "perform their gender roles," adding strain to domestic life (Azad, Hossain et al. 2013). Moreover, domestic violence takes a more severe toll on women who have already experienced trauma, such as disasters. Women who face gender-based violence in the aftermath of cyclones endure fear, helplessness, decreased self-confidence, and symptoms of post-traumatic stress disorder (PTSD), in addition to physical injuries, often left untreated.

The Government of Bangladesh has implemented various national plans in accordance with the formats recommended by the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC). The Ministry of Environment, Forests, and Climate Change (MOEFCC) of Bangladesh took the initiative to create the National Adaptation Programmes of Action (NAPA) and the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) to combat the adverse effects of climate change, particularly concerning public health.

Bangladesh has made considerable progress in developing health policies to address the healthcare needs of its population. However, despite these efforts, there are still a few gaps in health policies that need to be addressed to improve the overall healthcare system in the country.

1.2 Key policies, strategies, and plans

Over the last three decades, Bangladesh has made substantial investments to make the country more climate-resilient and less vulnerable to extreme weather events. To guide this process various plans, strategies, and policies have been developed. The following sections highlight key institutional and policy mechanisms for climate change and health (WHO, 2015d).

1.3 Eighth Five-Year Plan, 2020-2025

The Eighth Five Year-Plan has been designed to align with Bangladesh's Vision 2041, aiming to transform the nation into a prosperous and developed country. It recognizes the importance of achieving sustainable economic growth, reducing poverty, ensuring social justice, and enhancing environmental sustainability. It is noteworthy to mention the emergence COVID-19 during the development of the Eight Five-Year Plan which assisted in identifying gaps to be addressed within the health and social protection systems in the plan. Strategic direction has been given to climate change and health under the following areas:

- The plan emphasizes the need to build resilience against the adverse impacts of climate change implementing measures such as climate-smart agriculture practices and capacity building.
- The plan prioritizes the promotion of renewable energy sources to reduce greenhouse gas emissions and dependence on fossil fuels.
- The plan focuses on conservation and sustainable management strategies by recognizing the importance of natural resources for livelihoods and ecosystems.
- The plan stresses the importance of strengthening partnerships with bilateral and multilateral agencies to advocate for climate action and secure support for climate resilience and adaptation efforts.
- The plan highlights the importance of public health education and awareness-raising campaigns to mitigate climate-related health risks.
- The plan discusses the importance of strengthening physical health care facilities, access to healthcare and availability of quality healthcare staff, as well as developing sectoral strategies for the rapid recovery from COVID-19.

1.3.1 National Adaptation Plan (NAP), 2023-2050

National Adaptation Plan (NAP) has been formulated in Bangladesh recognizing that effective medium- and long-term adaptation strategies are imperative to reduce the negative impacts of climate change. It intends to promote sustainable planning for future development, aiming for a viable path to climate-resilient development and minimized climate risks and vulnerabilities. The NAP envisions to establish Bangladesh as a climate-resilient nation through effective adaptation strategies that foster a robust society and ecosystems and stimulate sustainable economic growth. Six national adaptation goals have been set to achieve this vision:

- Goal 1: Ensure protection against climate change variability and induced natural disasters

- Goal 2: Develop climate-resilient agriculture for food, nutrition, and livelihood security
- Goal 3: Develop climate-smart cities for improved urban environment and well-being
- Goal 4: Promote nature-based solutions for conservation of forestry, biodiversity, and well-being of communities
- Goal 5: Impart good governance through integration of adaptation into the planning process
- Goal 6: Ensure transformative capacity building and innovation for CCA

1.3.2 Mujib Climate Prosperity Plan (MCP), 2022-2041

The Mujib Climate Prosperity Plan (MCP) is a comprehensive strategy formulated to address the challenges of climate change in Bangladesh while promoting economic prosperity and sustainable development. The plan's key pillars include building resilience and resource efficiency through infrastructure and agriculture, promoting green growth and sustainable industries, ensuring social development and climate justice, diversifying financing sources, and strengthening governance institutions. Few key components of the MCP include:

- Building resilience to climate change impacts such as sea-level rise, increased frequency of extreme weather events, and changing rainfall patterns.
- Promoting sustainable and inclusive economic growth by investing in renewable energy, green infrastructure, and low-carbon technologies.
- Emphasizing the conservation and restoration of ecosystems, including forests, wetlands, and coastal areas, to enhance biodiversity, mitigate climate change, and provide livelihood opportunities for local communities.

1.3.3 Bangladesh Delta Plan (BDP), 2100

The Bangladesh Delta, the largest dynamic delta of the world, along with a large and growing population base faces many development challenges, especially in terms of risks from natural hazards. The Government of Bangladesh has hence recently adopted the Bangladesh Delta Plan 2100 which is a comprehensive 100-year strategic plan aimed at gradual sustainable development through adaptive delta management process. The plan targets to attain a safe, climate-resilient and prosperous delta with the mission of ensuring long term water and food security, economic growth and environmental sustainability, by effectively reducing vulnerability to natural disasters and building resilience to climate change.

1.3.4 Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009

The Climate Change Action Plan is built on six pillars. The first, entitled “Food security, social protection and health” aims to ensure that the poorest and most vulnerable in society, including women and children, are protected from climate change and that all programmes focus on the needs of this group for food security, safe housing, employment and access to basic services, including health.

The remaining pillars include comprehensive disaster management; infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building and institutional strengthening, do not directly mention health. However, in the Annex there is an exhaustive list of the programmes that relate to each of the six pillars, a number of which mention health, albeit superficially. Note though that no mention is made in BCCSAP about which programmes

should be prioritized or how much they are likely to cost. The main body of the report is split into four sections:

- Climate Hazards in Bangladesh – mentions health in the context of multi-purpose cyclone shelters being able to be used as health centers
- Impacts of Climate Change – mentions health in the context of the impacts of climate change on safe drinking water, climatic changes affecting the health of the poor, and public health measures being needed to prepare for increasing incidences of water- and air-borne diseases associated with climate change
- Adapting to Climate Change – mentions that the Department of Public Health Engineering is one of the government ministries involved in climate change. The Health Ministry is listed as one of the ‘other ministries’ responsible for sectors that are vulnerable to climate change. This section also acknowledges that civil society has improved health of poor people, thus making them more resilient.

Towards a Climate Change Strategy and Action Plan – identifies that health education and awareness needed to address increased prevalence of disease and disease vectors.

1.3.5 National Determination Contribution (NDC), 2021

The National Determination Contribution (NDC) of Bangladesh outlines the country's commitments and strategies to address climate change by emphasizing adaptation efforts to cope with the adverse impacts of climate change, particularly in vulnerable sectors such as agriculture, water resources, health, and disaster management. Moreover, the NDC calls for a number of mitigation actions that will help limit the country's GHG emissions to facilitate the transition to a low-carbon, climate-resilient, middle-income country whilst ensuring that it will not cross the average per capita emissions of the developing countries. The key components of NDC include – (i) enhancing resilience to cyclones and other extreme weather events, (ii) promoting sustainable agriculture and forestry practices, and (iii) investing in renewable energy to reduce greenhouse gas emissions.

1.3.6 Health, Population and Nutrition Sector Development Plan (HPNSDP), 2011-2016

The HPNSDP recognizes ‘climate change and health protection’ as one of eight key priority interventions. As a result, one section of the document deals with ‘Environmental Health and Climate Change’. As per the *National Health Policy – An Update 2008*, this document recognizes the impacts that climate change will have on maintaining basic health needs. It refers to the formation of the CCHPU, which was formed to strengthen necessary activities to prepare all levels of the health sector for long-term climate change impacts as well as post-disaster management. It specifies that further research will be conducted on the impacts of climate change on health and recommends creating an institute for environmental and occupational health safety, which will conduct academic courses, research and monitoring of environmental and occupational health issues. There are four priority interventions included in this section of the HPNSDP:

- Strengthening activities of the CCHPU to combat the health impact of climate change and updating guidelines for health protection from adverse effects and pre and post disaster situation.
- Developing an advanced preparedness plan to face the consequences of climate change.
- Standardizing emergency health supplies and their stockpiling as part of the readiness program on climate change.

1.3.7 Climate Change and Health Adaptation Strategy Report, 2012

This report was funded by WHO and prepared by the Climate Change and Health Promotion Unit of the Ministry of Health and Family Welfare. The document provides an extensive overview of the current and potential impacts of climate change on health outcomes, including vector-borne disease, water-borne disease, cardiovascular diseases, mental health, and extreme weather events. Broad level health adaptation strategies, including possible financing, are highlighted, however a clear plan of action is yet to be developed.

1.3.8 Sustainable Development Goals, 2030

The United Nations 2030 global agenda for sustainable development contains seventeen goals, most of which are related to health. In addition to Goal 13: Take Urgent Action to Combat Climate Change and its Impacts, other goals are relevant to climate change and health adaptation, including Goal 2: End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture, Goal 3: Ensure Health Lives and Promote Well-Being for All Ages, Goal 6: Ensure Availability and Sustainable Management of Water and Sanitation for All, as well as others.

1.4 Key Policy and Implementation Gaps for Health Adaptation

A Review of Policies/Strategies, Plans and Programmes relating to Health and Climate Change in Bangladesh conducted in 2013 identified the following gaps in policy for climate change and health adaptation.

- a clear definition of the climate change health sector
- a national strategic mechanism to address gaps in knowledge and ensure that research outputs inform policy and practice
- clear prioritization of health issues for adaptation
- identification of exactly who the health sector should engage with
- specification of how, where and when the health sector should engage with others
- evaluation of the extent to which past recommendations have been achieved and have reduced vulnerability to climate change;
- clear identification of measurable outputs or outcomes associated with future interventions; and
- clear timelines for action and funding strategies.

Additionally, the WHO Climate Change and Health Country Profile (2015) reported the status of development or implementation of climate resilient measures, plans, or strategies for health adaptation and mitigation of climate change. Although much progress has been made, the following activities had not been completed as of 2015.

- Climate information included in Integrated Disease Surveillance and Response
- Development of EWS and response for climate-sensitive health risks
- Costing exercise for climate change and health adaptation
- CC&H resilience costs included into domestic and international planned allocations
- Conducted valuation of co-benefits of health implications of mitigation policies

1.5 C3HNAP Formation

The impacts climate change and variability on human health and the health sector are inevitable with a variable magnitude. The cause-effect relations of human health in relation to climate stimuli are not properly understood yet in Bangladesh. A concrete adaptation plan for health and the health sector is necessary to improve the understanding of the health impacts of and adaptation to climate change among relevant stakeholders, including health policy makers, professionals, workers, program designers, program implementers, civil servants, civil society members.

Created under the global UNFCCC climate change agenda, the National Adaptation Plan (NAP) process builds on the National Adaptation Programmes of Action (NAPA) process that was designed to support least-developed countries (LDCs) to identify priority actions to respond to their urgent and immediate adaptation needs. The NAP process is intended to provide support for medium- and long-term adaptation planning needs in LDCs and other developing countries. The health national adaptation process (C3HNAP) should be the health component of the National Adaptation Plan (NAP), including as an output a detailed health adaptation plan designed to achieve the national health adaptation goals within a specific period of time and given available resources. (WHO, 2014).

In Glasgow, COP 26, there was declaration of COP26 Health program which declared two commitments to combat the impact of climate change on health

Commitment 1: Climate Resilient Health System

- Commit to conduct climate change and health **vulnerability and adaptation assessments** (V&As) at population level and/or health care facility level by a stated target date
- Commit to develop a **health national adaptation plan** informed by the health V&A, which forms part of the National Adaptation Plan to be published by a stated target date.
- Commit to use the V&A and C3HNAP to facilitate access to **climate change funding for health** (e.g., project proposals submitted to the Global Environmental Facility, Green Climate Fund, Adaptation Fund, or GCF Readiness programme)

Commitment 2: Sustainable Low Carbon Health System

- High ambition/high emitters: Commit to set a target date by which to achieve **health system net zero emissions**
- Commitment to deliver a **baseline assessment** of greenhouse gas emissions of the health system (including supply chains)

Commit to develop an **action plan or roadmap** by a set date to develop a sustainable low carbon health system (including supply chains) which also considers human exposure to air pollution and the role the health sector can play in reducing exposure to air pollution through its activities and its actions.

1.6 Vision and Goal

The C3HNAP aims to give strategic guidance to the Bangladesh health sector for establishing a climate-resilient health system, including increased capacity to plan health adaptation measures to prevent and/or overcome existing and future risks, and to respond promptly to climate change risks for health and well-being. The over-arching purpose of the C3HNAP is to ensure the health sector works with partners in the environment, as well as other related sectors, and follows a systematic process to:

- Engage in the overall NAP process at the national level

- Identify national strategic goals for building health resilience to climate change
- Develop a national plan with prioritized activities to achieve these goals, within a specified time period and given resources
- Build pathways to implement strategies and policies through the funding of different global funds

In addition, the C3HNAP will support integration of the health risks due to climate variability and change into national health planning processes and promote implementation of health adaptation policies and programs at national and local levels. Furthermore, the C3HNAP is designed to be an iterative process to encourage the inclusion of new information and data as situations change. Community health adaptation options identified in previous climate change and health assessments and strategies include (CCHP, 2012):

- Public education and awareness
- Early warning systems for disease outbreaks
- Community based neighborhood support
- Climate-proof housing
- Disaster preparedness, including health system surge capacity
- Enhanced disease control programme
- Improved surveillance on risk indicators and health outcomes
- Appropriate workforce training and mid-career development

Health adaptation targets include (MoH&FWFW, 2011):

- Strengthening activities of the Climate Change and Health Promotion Unit to combat the health impact of climate change and updating guidelines for health protection from adverse effects and pre-and-post disaster situation.
- Developing an advanced preparedness plan to face the consequences of climate change.
- Standardizing emergency health supplies and their stockpiling as part of the readiness program on climate change.
- Creating an institute for environmental and occupational health safety.

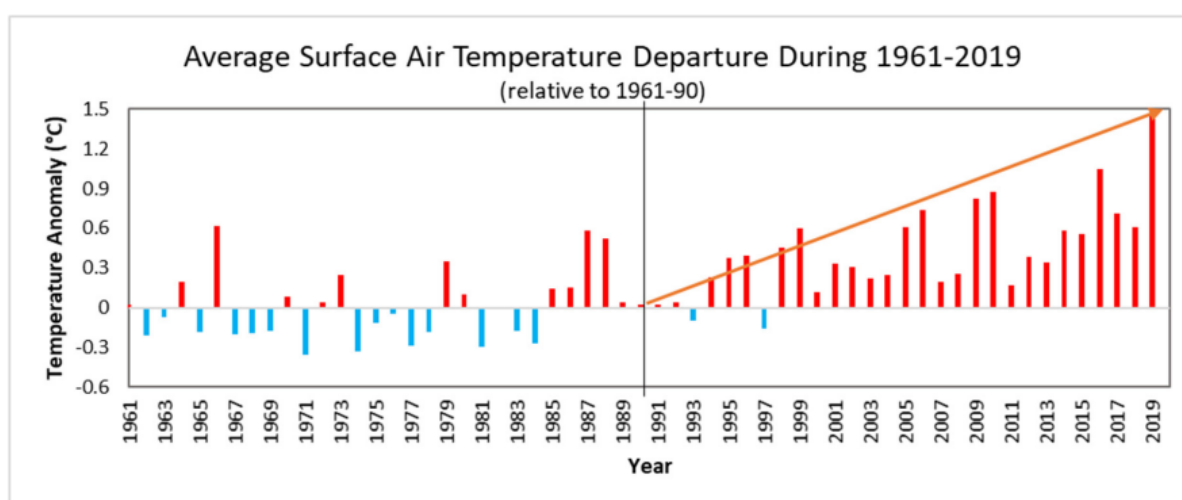
1.7 C3HNAP Development Process

The NHAP was developed in collaboration with the CCHP Unit, IEDCR of Ministry of Health and Family Welfare and key climate change and health-related stakeholders with support from the World Health Organization (WHO). An extensive literature review was conducted to take stock of all relevant policies, legislation, strategies, programmes, and studies on climate change and health. The C3HNAP development was guided by previous CC&H vulnerability and adaptation assessments (WHO, IEDCR 2011), the Health Adaptation Strategy (WHO-2012), Health, Population and Nutrition Sector Development Plan (HPNSDP 2017-2022), the Bangladesh Climate Change Strategy and Action Plan (2009), as well as the WHO Operational Framework for Building Climate-Resilient Health Systems (2015), WHO Quality Criteria for Health National Adaptation Plans (2021)

2 Climate Change related Health Risk & Vulnerability in Bangladesh

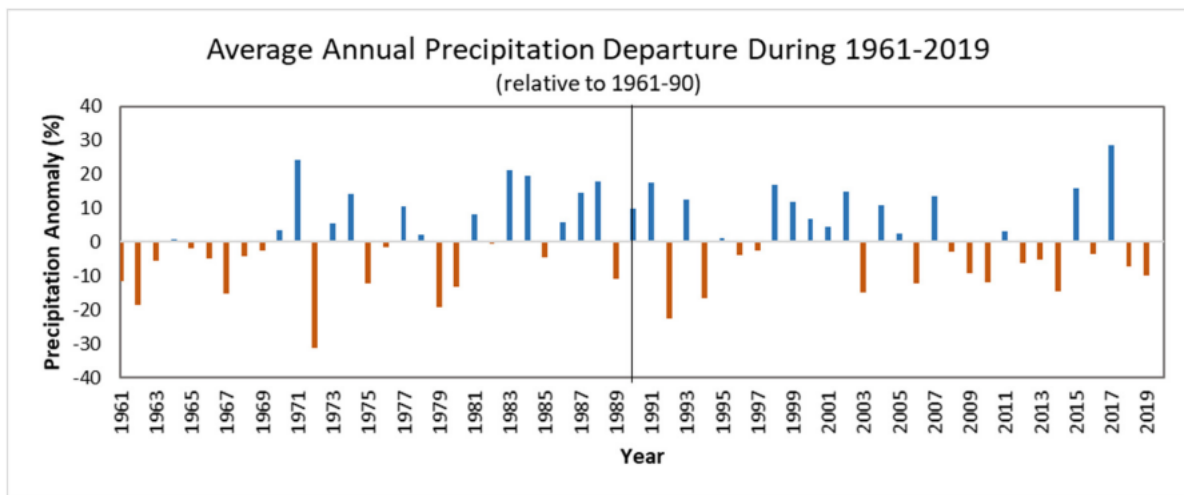
2.1 Historical Climate Trend

Bangladesh is considered one of the most vulnerable countries in the world to the impacts of climate change. Vast coastal areas and a reliance on natural resources combined with high population density and high rates of poverty leave the population at high-risk of extreme weather events, including increasing temperatures, cyclones, erratic rainfall, flooding, drought, rising sea levels, and saltwater intrusion (WHO, 2015). Bangladesh has a humid, tropical climate that is influenced by monsoon circulations. There are four prominent seasons, including winter/northeast monsoon (December-February); summer/pre-monsoon (March-May); southwest monsoon (June-September); and Autumn/post-monsoon (October-November). January is the coldest month with average temperatures ranging from 18°-22°C and April is the warmest month with average temperatures ranging from 33°-36° C. Heavy rainfall is a major characteristic of Bangladesh, which most areas receiving at least 2000 mm of rainfall per year. Regions in the northeast are the wettest, receiving on average 4000 mm of rainfall per year compared to the relatively dry western region, which only receives on average around 1600 mm per year. More than 71% of rainfall occurs during monsoon season. Humidity is also highest during monsoon seasons and lowest in the winter season varying from 73% to 86%.

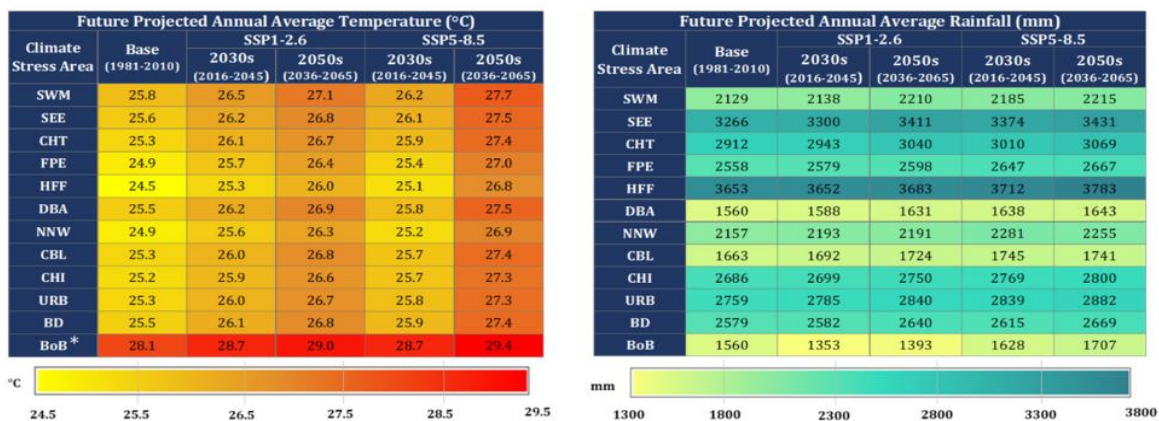


Departure of average annual temperature in Bangladesh relative to climate normal of 1960-1990

Source: CEGIS analysis based on BMD data.

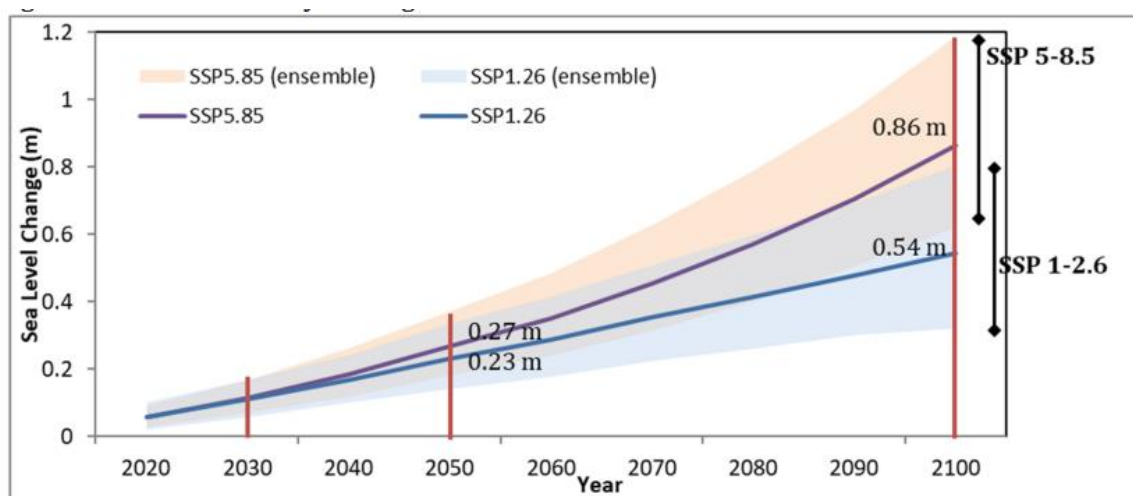


Departure of average annual precipitation in Bangladesh relative to the climate normal of 1961-1990
Source: CEGIS analysis based on BMD data.



Future projections of temperature and rainfall for Bangladesh and different climate stress areas based on downscaled climate data

(Source: CEGIS analysis from the IPCC Sixth Assessment Report multi-model ensemble)



Sea-level rise projections near the Bangladesh coast in the Bay of Bengal

Note: The lines and shaded region represent the ensemble average of sea-level rise and the spread of ensemble results from the IPCC CMIP6 models, respectively. (Source: Fox Kemper et al., 2021.)

The mean annual temperature in Bangladesh has risen by about 1°C during the period 1981-2010, with observed extreme temperatures (>40°C) also increasing from 62 from 1981-1990 to 139 from 2001-2010 (IEDCR, 2012) (Figure 1). Under low and high emissions scenarios, the annual mean temperature is expected to increase by about 1.4°C by 2050 and 4.8°C by 2100 respectively, compared to the current average of 25°C (WHO, 2015a). Similarly, rainfall patterns are becoming more erratic in Bangladesh leading to increased incidences of flooding and drought. Shifts in the magnitude and timing of monsoon rains has resulted in several reoccurring flood events over the past decade, as well as 21% less rain during the monsoon period (June-August) in 2012.

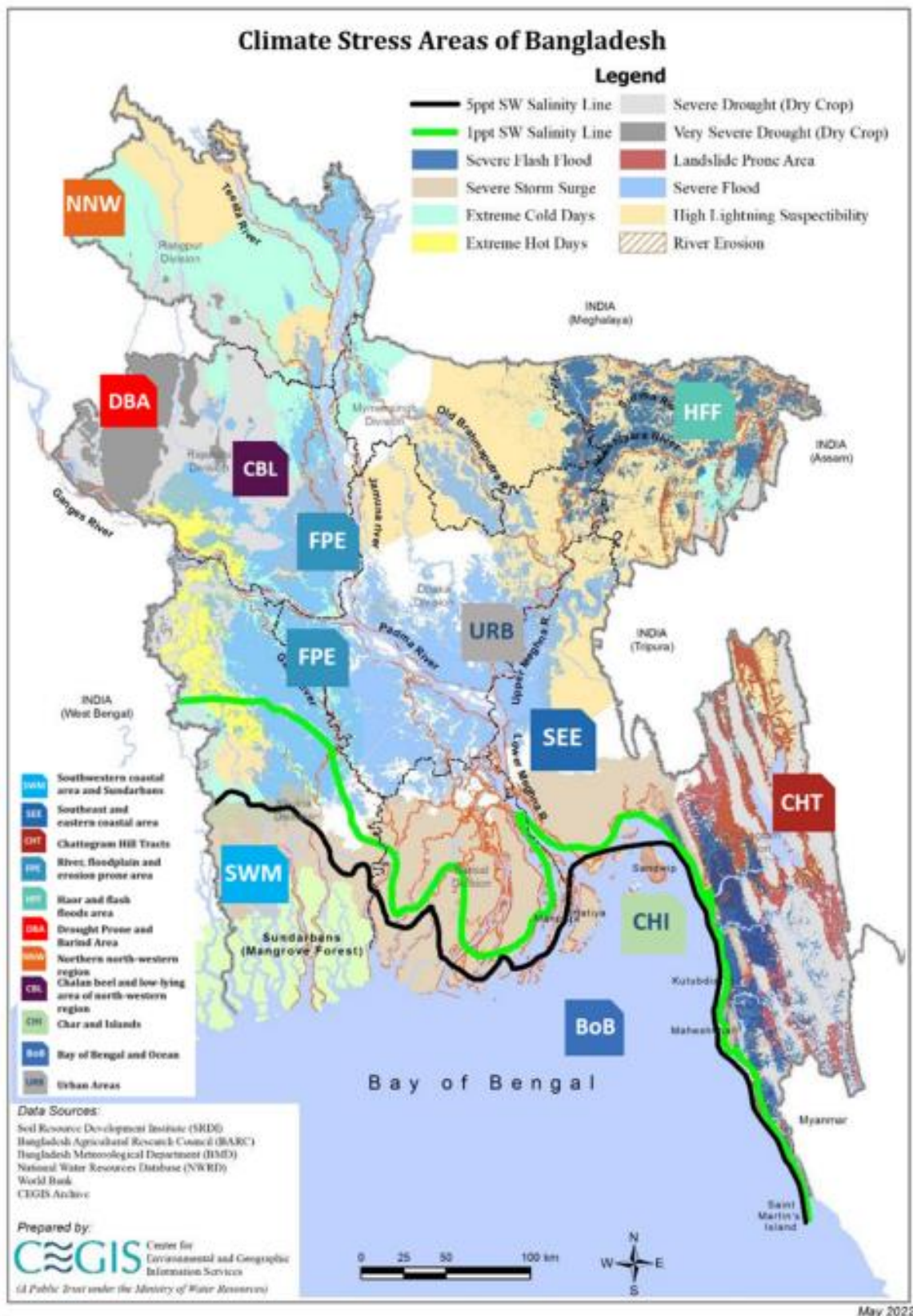
2.2 Future Climate Risk and Vulnerability as mentioned in the NAP (2023-2050)

In the NAP A multi-hazards risk map for Bangladesh illustrates the spatial distribution across the country (CEGIS, 2021). The risk map includes all described hazards and segregates the country into 11 climate stress areas defined as follows.

Climate Stress area	Districts	Area (sq. km)	Vulnerable population, 2020 (millions)	Prominence of climate hazards
South-western coastal area and Sundarbans (SWM)	Satkhirā, Khulna, Bagherhat, Pirojpur, Barguna, Barisal, Patuakhali, Jhalokhathi, Bhola, Shariatpur, Gopalganj, Jashore, Sundarbans	30,646	13.57	Rainfall variability, river floods, sealevel rise, salinity, tropical cyclone, storm surges, drought, extreme heat waves, extreme cold, riverbank erosion and lightning
South-east and eastern coastal area (SEE)	Noakhali, Feni, Lakshmipur, Chattogram, Cox's Bazar, Chandpur	13,891	10.93	Rainfall variability, river floods, sealevel rise, salinity, tropical cyclone, storm surges, drought, extreme heat waves, extreme cold, riverbank erosion, lightning and landslides
Chattogram Hill Tracts (CHT)	Rangamati, Khagrachari, Bandarban	13,294	1.33	Rainfall variability, flash floods, tropical cyclone, storm surges, drought, extreme heat waves, extreme cold, lightning and landslides
Rivers, floodplains, and erosionprone areas (FPE)	Nilphamari, Kurigram, Lalmonirhat, Gaibandha, Rangpur, Bogura, Sirajganj, Pabna, Rajshahi, Jamalpur, Tangail, Manikganj, Dhaka, Munshiganj, Mymensingh, Sunamganj,	58,010	12.72	Rainfall variability, river floods, tropical cyclones, tornado, extreme heat waves, extreme cold, riverbank erosion and lightning

Climate Stress area	Districts	Area (sq. km)	Vulnerable population, 2020 (millions)	Prominence of climate hazards
	Netrokona, Habiganj, Kishorganj, Sylhet, Brahmanbaria, Narsingdi, Narayanganj, Rajbari, Faridpur, Madaripur, Gopalganj, Narail, Sariatpur, Barisal, Patuakhali, Bhola, Jhalokathi, Khulna, Chandpur, Cumilla, Noakhali, Lakshmipur, Cox's Bazar			
Haor and flash floods areas (HFF)	Sunamganj, Netrokona, Habiganj, Kishorganj, Sylhet, Maulvibazar, Brahmanbaria	19,662	4.02	Rainfall variability, flash floods, tropical cyclone, tornado, extreme heat waves, intense cold, riverbank erosion, lightning and landslides
Droughtprone and barind areas (DBA)	Naogaon, Chapai Nawabganj, Rajshahi, Bogura, Joypurhat, Rangpur, Dinajpur, Meherpur, Chudanga, Kushtia, Jashore, Magura, Jhenaidah	21,512	3.85	Rainfall variability, tropical cyclone, tornado drought, extreme heat waves, extreme cold and lightning
Northern, north-western region (NNW)	Panchagarh, Thakurgaon, Nilphamari, Lalmonirhat, Rangpur, Kurigram, Dinajpur	9,917	6.32	Rainfall variability, river floods, flash floods, tropical cyclone, tornado, drought, extreme heat waves, extreme cold, riverbank erosion, lightning and landslides
Chalan beel and low-lying area of the north-western region (CBL)	Pabna, Natore, Sirajganj, Rajshahi, Naogaon	5,027	5.70	Rainfall variability, river floods, , tropical cyclone, tornado,, extreme heat waves, extreme cold, riverbank erosion and lightning
Char and islands (CHI)	Nilphamari, Lalmonirhat, Kurigram, Gaibandha, Sirajganj, Jamalpur, Mymensingh, Manikganj, Munshiganj, Shariatpur,	3,976	8.51	Rainfall variability, river floods, sealevel rise, salinity, , tropical cyclone, tornado, storm surges, extreme heat waves,

Climate Stress area	Districts	Area (sq. km)	Vulnerable population, 2020 (millions)	Prominence of climate hazards
	Chandpur, Bhola, Patuakhali, Feni, Noakhali, Lakshmipur, Chattogram, Cox's Bazar			extreme cold, river bank erosion, lightning, higher sea surface temperature and ocean acidification
Bay of Bengal and ocean (BoB)	Bay of Bengal (maritime boundary)	118,813	1.26	Rainfall variability, sea-level rise, tropical cyclone, tornado, storm surges, extreme heat waves, lightning, higher sea surface temperature, hypoxia and ocean acidification
Urban areas (URB)	43 cities	10,600	32.41	Rainfall variability, urban floods, sealevel rise, salinity, tropical cyclone, storm surges, drought, extreme urban heat waves, extreme cold and lightning





The map and table describe the geographic coverage of the hazards and potentially vulnerable populations across the climate stress areas. Most areas face five or more disasters. With all disasters intensifying or becoming more frequent due to climate change, the climate stress areas face larger risks in the future.

2.3 Risks and Vulnerabilities of Health sectors

To better understand the health risks of and adaptation to climate change a vulnerability and adaptation assessment Climate Change and Health: Bangladesh was conducted in 2011 with the goal to assess existing patterns of climate-sensitive diseases, documenting climate change and health impacts on vulnerable populations, reviewing existing climate change and health-related policies and programmes, and recommend actions to further protect human health from climate change (IEDCR, 2011). The study, which was prepared by the Institute of Epidemiology, Disease Control and Research, the Directorate General of Health Services, and the Ministry of Health and Family Welfare with support from BCCT, used qualitative and quantitative approaches based on data availability to explore associations between climatic variables and a range of climate-related health outcomes, including vector-borne diseases (kala-azar, dengue, and malaria), water-borne diseases (cholera and diarrhoea), and mental health, as well as impact from extreme weather events. The data showed significant co-relationship between climatic factors and kala-azar incidence in Mymensingh, Tangail and Jamalpur districts, the three districts with majority of kala-azar cases in Bangladesh. To quantify the extent of impact from climate change on diarrhoea incidences, the report analyzed the relationship between temperatures and admitted cases of diarrhoea. These results were then used to establish scenarios as indicative measures of potential climate change impacts to diarrhoea distribution in Bangladesh by 2030. Estimates presented in the report predict a 4.5–5.5% increase of initial risk of diarrheal diseases by year 2030 for a 1°C increase in temperatures for Bangladesh. Although the analysis was impeded by limited data availability, the V&A was able to take important steps toward evaluating climate change impacts on disease in Bangladesh. Nonetheless, a comprehensive V&A assessment, as well as further analysis and quantification of the health impacts of climate change is needed.

Additionally, in 2015 WHO conducted a ***Vulnerability and Adaptation to Climate Change in Coastal and Drought Prone Areas of Bangladesh: Health and WASH***, to better understand the vulnerabilities of the communities due to the impact of climate change and its links to WASH and health in Bangladesh (WHO, 2015c). The study used both qualitative and quantitative methods including a survey questionnaire, community workshops, and in-depth interviews. Field sites were pre-selected to include both flood and drought prone areas based on expert judgement. In total three communities (one in a drought prone area and two in coastal areas) were selected in three distinct geographical areas. Drought prone areas were identified as the most vulnerable to changes in climate associated with reduced rainfall and reliability of seasons which impacted the drinking water supplies, agricultural production, livelihood and has been exacerbating poverty. The coastal communities were identified as being vulnerable to climate changes associated with increased rainfall, more frequent and extensive flooding, extreme temperatures (hot and cold), changing seasonal patterns and sea-level rise. Finally, the study provided the broad recommendations to enhance vulnerability assessments and evidence base for health adaptation, including the establishment of a climate-sensitive disease surveillance system, increased awareness of upazila health staff of collection of data for CSD, quality assurance measures for data collection and reporting, and daily data to allow for seasonal and cyclical patterns of CSD monitoring.

The effects of climate change on health are severe in Bangladesh with the health status of millions of people in vulnerable areas projected to be impacted. Projected impacts include:

Table 1: Climate Change Impacts on Health

Climate Change Characteristics	Projected changes	Impacts on Health
Increasing air and sea-surface temperatures	Average air temperatures are expected to increase by up to 1.4° C by 2050 and by 4.8° C by 2100, depending on future greenhouse gas emissions scenarios (WHO, 2015a).	Reduced agriculture and fisheries production leading to increased food insecurity and food safety issues. Increased risk of heat-related illnesses.
Altered rainfall patterns	Most models predict drier dry seasons and wetter wet seasons for Bangladesh, as well as more “extreme/high “rainfall events (WHO, 2015a).	Increased risk of drought and flooding leading to negative effects on agriculture production and under-nutrition. Increased risk vector-borne disease (malaria, dengue, kala-azar, and chikungunya) and water borne diseases, notably diarrhoeal disease
More severe extreme weather events	Tropical cyclones are expected to decrease in frequency but increase in intensity. 20.3 million people are projected to live in cyclone high-risk areas by 2050 compared to 8.3 million in 2015 (WHO, 2015a).	Destruction of farming lands and health facilities. Injuries and death from extreme weather events. Mental health issues due to climate-related population displacement and effects on livelihoods
Sea-level rise	Current saline intrusion reaches 100km from the Bay of Bengal. 7.2 million people are projected to be affected by flooding due to sea-level rise every year	For low-lying coastal communities sea-level rise can cause crop failure, saline intrusion into drinking water supplies, erosion and possibly even the need for relocation.

Climate Change Characteristics	Projected changes	Impacts on Health
	between 2070-2100 under a high emissions scenario (WHO, 2015a).	
Ocean acidification	The increasing acidity of sea-waters has a detrimental impact on ecosystems and reduced biodiversity (WHO, 2015a).	Destruction of ecosystems and reduced biodiversity can have negative impacts on fishing industries and lead to increased food insecurity.
Air pollution	Many drivers of climate change also contribute to air pollution. Outdoor air pollution data for 5 cities in Bangladesh have PM _{2.5} levels greater than WHO guidelines. Household air pollution is also high in rural communities (WHO, 2015a).	Increased morbidity and mortality from respiratory infections, lung cancer, and cardiovascular disease

To address these concerns, the government of Bangladesh has outlined strategic plans and policies that aim to reduce vulnerability and build capacity to manage the health risks of climate change. In 2009 the government the Bangladesh Climate Change Strategy and Action plan (BCCSAP), which included six pillars, with health belonging to 1st pillar. After the call of Conference of Parties (COP-18) held in Doha, Qatar in 2012, the government of Bangladesh took initiative to develop National Adaptation Plans (NAP). The NAP process is intended to provide support for medium and long-term adaptation planning. The Ministry of Environment and Forests of Bangladesh, in collaboration with UNDP, has been providing support to develop the NAP. However, only a few programmes for mitigation and adaptation to climate change have been incorporated to date. In 2022, Bangladesh has published an extensive National Adaptation Plan (NAP) 2023-2050. Health is a cross-cutting issue in the context of climate change, and there is a need to mainstream health in mitigation and adaptation strategies in all sectors. The health component of National Adaptation Plan (C3HNAP) needs to be developed for integrating climate change adaptation into relevant national health plans and policies

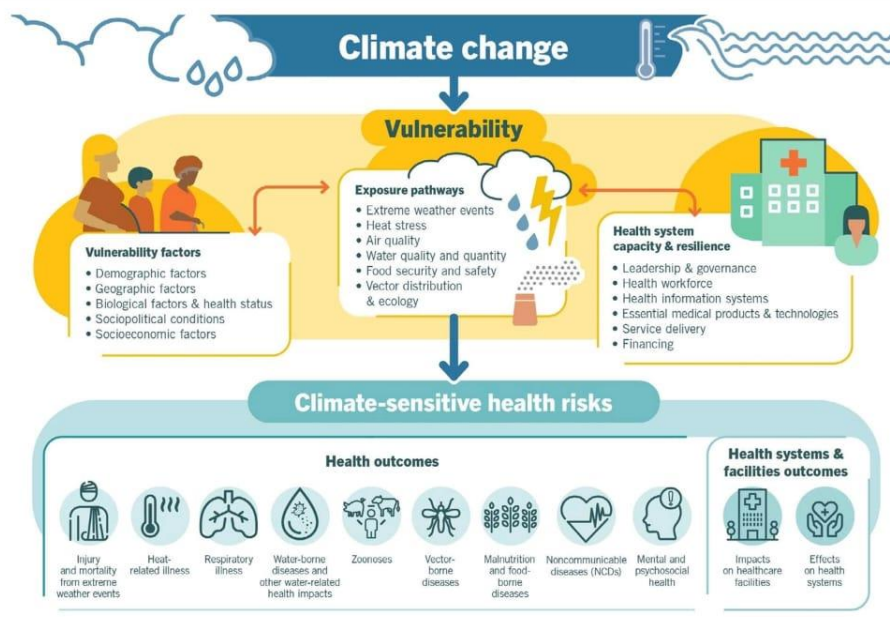


Fig: Impact of Climate Change on Health (Source: Quality Guidelines for National Adaptation Plan, World Health Organization, 2021)

2.3.1 Water-borne and Water-related Disease

Climate change and variability, particularly impacts from drought, flooding, and tropical cyclones, pose a substantial threat to water security and are projected to increase the potential of waterborne infectious diseases in Bangladesh, including cholera and other diarrhoeal diseases. Waterborne diseases (WBDs) remain a significant concern globally, affecting both high-income and developing countries. They encompass a wide range of illnesses, including diarrheal diseases like cholera, shigella, cryptosporidiosis, typhoid, schistosomiasis, leptospirosis, hepatitis A and E, and poliomyelitis. Cholera outbreaks, which often occur during seasonal monsoons could become a regular phenomenon in the future due to climate change (Shahid, 2010). Extreme weather events also have the potential to damage water and sanitation infrastructure, disrupt health services, and create overcrowding situations resulting in serious waterborne disease risks to the affected population. This combined with other factors, such as high rates of urbanization and land-use change, put a significant strain on freshwater supplies and can lead to further risk of water-borne and water-related disease. In the baseline year 2008, there were an estimated 25 500 diarrhoeal deaths in children aged under 15 years. Under a high emissions scenario, diarrhoeal deaths attributable to climate change in children aged under 15 years are projected to comprise about 8% of the over 8000 deaths projected in 2030. Although diarrhoeal deaths are projected to decline to just under 900 by 2050, the proportion of deaths attributable to climate change will rise to 13%. Limited access to safe water and sanitation contributes to the risk of developing diarrhoeal disease. Children in poor rural and urban slum areas are at high risk. Transmission of enteric pathogens is higher during the rainy season. Drainage and storm-water management is important in low-income urban communities, as blocked drains are one of the causes of increased disease transmission. There have been significant gains in the provision of improved sanitation and safe water supplies over the past few years. Bangladesh, with studies finding variable results: both cholera and ETEC associated with floods; an initial peak in the incidence of rotavirus coinciding with flooding followed by a decline immediately after the flood receded; increases in the proportion of rotavirus diarrhea, rotavirus in older children, percentage of mixed rotavirus infection cases, and an abrupt change in epidemic strains coinciding with the spread of floods; cholera

playing a primary role in flood-related diarrhea epidemics, but rotavirus and ETEC also contributing to the epidemics; cholera as the most common cause of diarrhea during flood years, with rotavirus more common in non-flood years. Heavy rainfall and diarrhea have found mixed results. In some cases, positive associations have been observed, such as higher observed diarrhea rates during peak monsoon rainfall months in the Philippines and Bangladesh. (Levy, 2016)

2.3.1.1 Diarrhoea

In the baseline year 2008, there were an estimated 25 500 diarrhoeal deaths in children aged under 15 years. Under a high emissions scenario, diarrhoeal deaths attributable to climate change in children aged under 15 years are projected to comprise about 8% of the over 8000 deaths projected in 2030. Although diarrhoeal deaths are projected to decline to just under 900 by 2050, the proportion of deaths attributable to climate change will rise to 13%. Limited access to safe water and sanitation contributes to the risk of developing diarrhoeal disease. Children in poor rural and urban slum areas are at high risk. Transmission of enteric pathogens is higher during the rainy season. Drainage and storm-water management is important in low-income urban communities, as blocked drains are one of the causes of increased disease transmission. There have been significant gains in the provision of improved sanitation and safe water supplies over the past few years

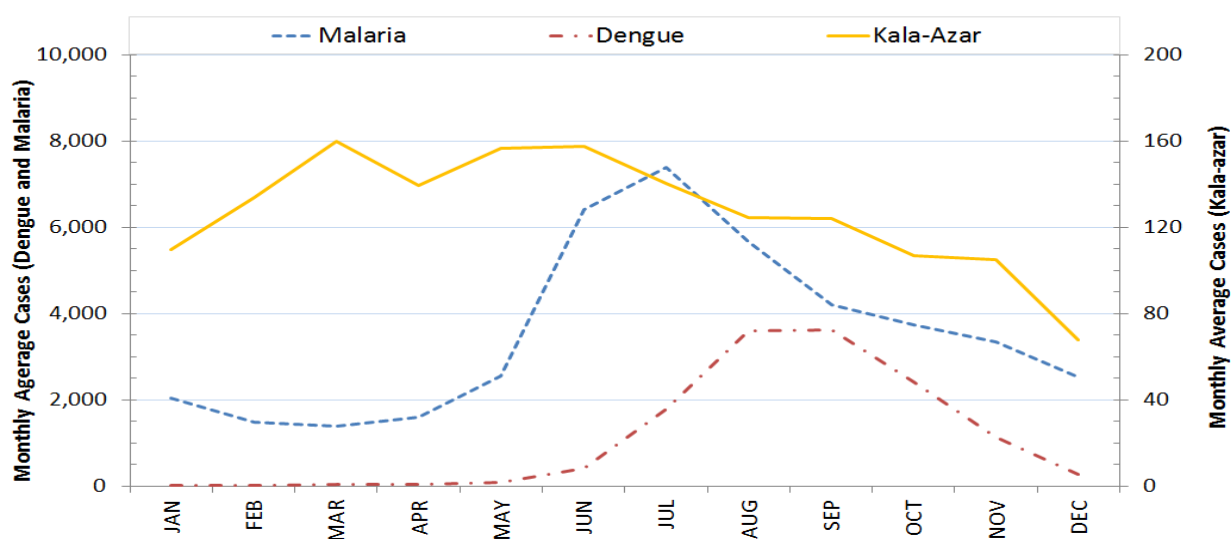
2.3.2 Vector-borne Disease

The transmission of vector-borne disease, particularly mosquito-borne diseases, are sensitive to climatic factors such as increases in temperature and humidity and changes in rainfall patterns, which affect both the mosquito lifecycle and the number of breeding sites (Kovats et al. 2003). An assessment supported by the World Bank using monthly surveillance data in regions of high-incidence of vector-borne disease found strong seasonality and statistically correlation between short-term climate variability and vector-borne disease. For malaria and dengue, climate variables, including temperature, rainfall, and humidity, had a strong correlation with disease caseload, both current and lagged. For kala-azar, only temperature was significantly correlated (CCHP, 2014).

Bangladesh is also vulnerable to other emerging climate-sensitive vector-borne diseases, for example Chikungunya, an arboviral disease transmitted between human beings via the bites of infected female aedes mosquitoes (*Aedes aegypti* and *Aedes albopictus*). In 2017, a major outbreak of Chikungunya was reported in Bangladesh with 984 cases confirmed and more than 13 176 clinically confirmed cases in 17 of 64 districts, including the capital Dhaka (Kabir et al. 2017). The outbreak was anticipated based on the distribution of the aedes vector, suitable climatic conditions, and unusual, excessive rainfalls, however limitations in testing infrastructure and resources delayed containment efforts. Climate model projections under both high and low emissions scenarios suggest the likelihood of expansion of transmission-suitable areas in many parts of the world (Tjaden et al. 2017).

Figure 1: Trends and monthly patterns for vector-borne diseases, 2000-11

Monthly Cases of Vector-borne Diseases in Bangladesh, 2011-2017



Source: National Kala-azar Elimination and National Malaria Control Program, WHO 2017

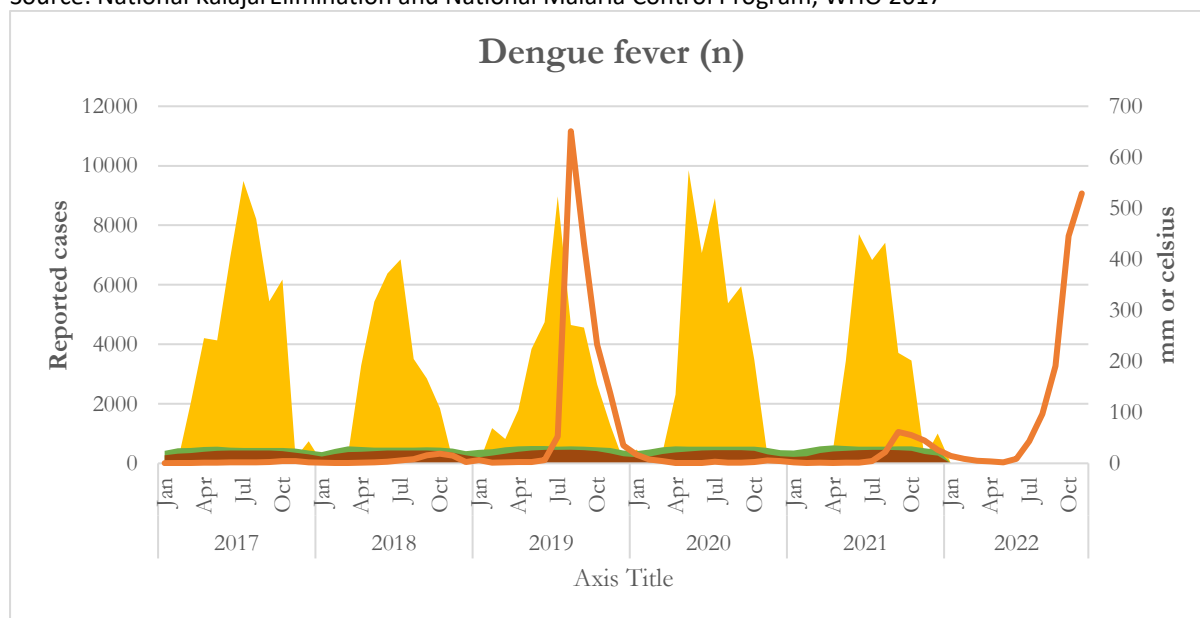


Fig: Trend of dengue in Bangladesh between January 2017 to November 2022.



Fig: Kala-Azar Cases in South East Asia Region (WHO, 2022)

2.3.2.1 Malaria

Considerable advances have been made in reducing the burden of malaria over the past decade. The National Malaria Control Programme is a vertical programme coordinated by the Communicable Disease Control Programme of the Directorate General of Health Services. Advances in diagnosis and treatment have contributed to reductions in severe malaria cases. A major problem for this programme is that the hyper-endemic forested and hilly areas are remote, largely undeveloped and inhabited by very poor people. The mainstay of prevention for populations at risk is the provision and use of insecticide-treated nets. Surveillance for malaria is performed mainly by nongovernmental organizations, and there is underreporting at the national level. Climate change will impact on the epidemiology of malaria in Bangladesh if the distribution of infected mosquitoes changes so that non-immune populations are exposed. It is projected that by 2070 over 147 million people will be at risk of malaria, assuming a high emissions scenario. If emissions decrease rapidly, this could decrease to 117 million people, remaining closer to the estimated baseline of 100 million.

Figure 2: Geographic distribution of vector-borne disease in 2011

2.3.2.2 Dengue

Dengue is becoming endemic in major cities in Bangladesh. The burden of disease is high, although it is difficult to quantify as only hospitalized patients are reported. Dengue incidence is related to precipitation, humidity and temperature. Although cases occur year-round, peak incidence occurs in post-monsoon season. Climate change is expected to affect the epidemiology of dengue via various mechanisms. Changes in rainfall pattern, particularly longer rainy seasons, will increase the sites where *Aedes* mosquitoes breed. Increasing urbanization will increase breeding sites in close proximity to human habitation. Population migration will alter the underlying immunity to particular dengue serotypes or contribute to changing geographical serotype distributions, which can lead to outbreaks. Extreme weather events will disrupt health systems and the capacity to perform surveillance of, and

manage, outbreaks. Although it is difficult to quantify the projected burden of dengue under future climate change conditions, data from the Directorate General of Health Services of Dhaka city show that it is likely that the rapidly growing urban and peri-urban regions where public health measures (vector control, public education, surveillance) are compromised or neglected will be particularly affected.

2.3.2.3 Chikunguniya and Zika Virus

In 2008, Bangladesh experienced its initial outbreak of the disease in the border districts of Rajshahi and Chapainawabganj, adjacent to India. Following this, the disease resurfaced multiple times, including in 2011 within the Dohar sub-district of Dhaka and in 2012 in Palpapara village, Tangail district. The most recent outbreak occurred in Dhaka, the nation's capital, during the monsoon season of 2017, marking the continued re-emergence of Chikungunya fever in the country. A chikungunya outbreak in Bangladesh was anticipated because of the distribution of the aedes vector, suitable climatic conditions, and unusual, excessive rainfalls from January to March, 2017. From the onset of the outbreak in April 1, 2017, to Sept 7, 2017, the Bangladeshi Ministry of Health reported 984 cases confirmed by real-time PCR assay (figure) and more than 13 176 clinically confirmed cases in 17 of 64 districts. A major outbreak has been observed in the capital, Dhaka, which is home to more than 18 million people.

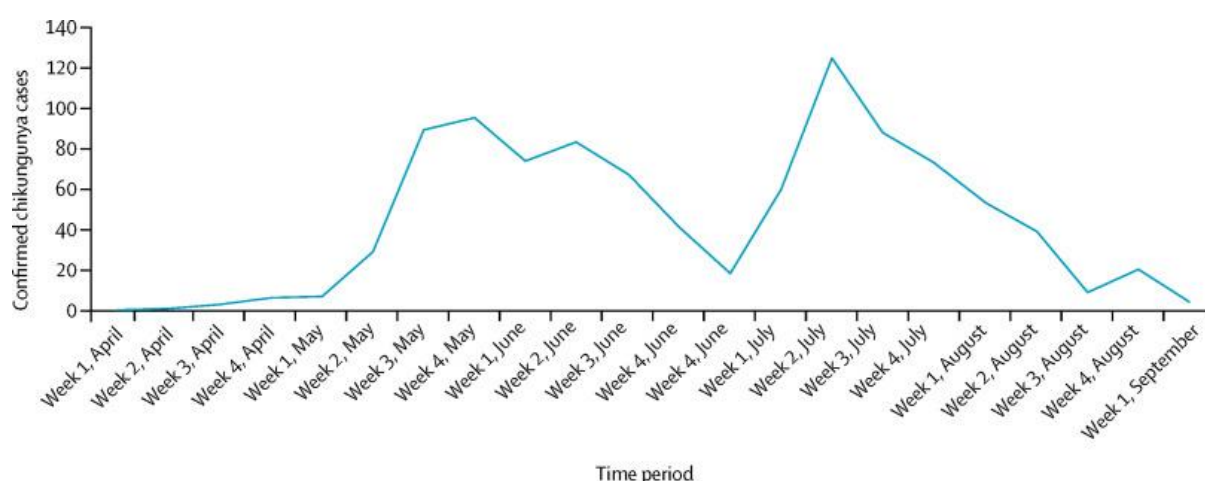


Figure: Chikunguniya Outbreak in 17 districts of Bangladesh (Iqbal, 2017)

Zika virus (ZIKV) infections were first identified in Bangladesh in 2013 through a seroprevalence study, with confirmed cases in Chittagong district in 2014, including detection via RT-PCR and genetic analysis. Despite limited clinical symptoms observed in a patient without recent travel history, the strain was closely related to those from Brazil and South America. With ZIKV prevalent in neighboring countries and affected Bangladeshi nationals in Singapore, the potential for ZIKV entry into Bangladesh is high, especially with frequent travel and recent Rohingya influx. Bangladesh's dense population and rapid urbanization increase the risk. Despite recent outbreaks of Chikungunya and Dengue, there's a lack of effective surveillance for ZIKV, raising concerns about undiagnosed cases or potential endemicity alongside other viral infections. (Hossain, 2019)

2.3.3 Nutrition and Food Security

Higher temperatures, land and water scarcity, flooding, droughts and displacement negatively impact on agricultural production and cause breakdown in food systems, disproportionately affecting people most vulnerable to hunger and leading to food insecurity. Vulnerable groups, especially children, risk further deterioration into food and nutrition crises if they are exposed to extreme weather events.

Without considerable efforts to improve climate resilience, it has been estimated that the risk of hunger and malnutrition could increase by up to 20% by 2050. In Bangladesh the prevalence of malnutrition in children aged under 5 years is 31.9% (WHO, 2015a). According to the 6th Assessment report of IPCC it states that Foodborne diseases (FBDs) result from consuming contaminated or spoiled food, linked to pathogens, toxins, and chemicals from production to consumption. Contamination, improper handling, and environmental factors like climate change exacerbate FBD risks, affecting the food chain and leading to malnutrition due to weakened immunity. A notable rise in FBDs correlates with higher temperatures and longer summers, with complex transmission pathways and a range of pathogens that thrive under stress, such as enteric viruses and bacteria like Salmonella, which is highly associated with ambient temperature increases. This association is evident in global studies, highlighting the urgent need to address FBDs amidst changing environmental conditions and food safety challenges. 2016 research highlights that climate change has exacerbated malnutrition rates among children under five in Bangladesh, intertwining climate change, food security, and health issues. Particularly in rural and underprivileged areas, climate change aggravates existing problems and poses new challenges, increasing vulnerability and health risks. This scenario underscores the urgent need for in-depth studies on the social impacts and community vulnerability to climate change effects (Farouque et al 2016)

2.3.4 Non-communicable Diseases

In Bangladesh, non-communicable diseases (NCDs) are emerging as a major cause of morbidity and mortality, accounting for 61% of deaths in 2013 (Alam et al. 2013). Cardiovascular disease, diabetes, and tobacco-related illness are the three most common NCDs in Bangladesh and make up a considerable proportion of mortality, morbidity, and health system utilization. The effects of climate change have the potential to exacerbate the incidence of some NCDs, including cardiovascular disease, some cancers, respiratory health, mental disorders, injuries, and malnutrition (Friel et al. 2011).

Although, literature remains limited, the impacts of climate change on NCDs, such as obesity, diabetes are an important emerging concern in Bangladesh. Examples of climate change as an additional driver of NCD risk include adverse effects on domestic agriculture, as well as climate change related population displacement leading to increased urbanization and driving unfavorable changes in diet and physical activity, further increasing the burden of NCDs.

2.3.5 Air Borne Disease

In Dhaka, Bangladesh, a study examining the impact of PM_{2.5} pollution from fossil fuel and biomass combustion on cardiovascular health and mortality reveals significant health risks. Exposure to PM_{2.5} increases the risk of cardiovascular emergencies, hospitalizations, and deaths, with a notably higher impact from fossil fuel combustion particles. For every 10- $\mu\text{g}/\text{m}^3$ rise in PM_{2.5} levels, there's an increased risk of cardiovascular emergency department visits by 0.27%, hospitalizations by 0.32%, and deaths by 0.87%. The effect of PM_{2.5} on health outcomes is more pronounced at lower concentrations, diminishing at higher levels, especially during periods dominated by crop burning. Fossil fuel-derived PM_{2.5} is particularly detrimental, having about four times the impact on cardiovascular mortality and double the effect on hospital admissions compared to biomass combustion. Additionally, nearly 80% of mothers in the study used solid fuels, showing a significant association with increased neonatal and infant mortality. The risk of death among newborns and infants was markedly higher for those whose mothers were exposed to solid fuels, especially when combined with indoor cooking, highlighting the severe health risks of air pollution from fossil fuels and biomass in Bangladesh (Rahman, 2017; Alam 2022) According to IPCC 6th Assessment Report Climate change significantly impacts respiratory tract infections (RTIs) through temperature extremes, humidity fluctuations, dust storms, and increased

climate variability. Among RTIs, pneumonia and influenza pose substantial health burdens, influenced by both climatic and non-climatic factors such as chronic diseases, air pollution, and immunization status. In temperate regions, pneumonia incidence peaks during winter, though its seasonality's precise causes are debated. Various studies report different shapes of temperature-pneumonia relationships, suggesting these are location-dependent. Additionally, humidity levels play a crucial role, with associations between pneumonia and combinations of high/low temperatures and humidity.

2.3.6 Sexual Reproductive Health Rights and Climate Change

In Bangladesh, sociocultural norms and restricted decision-making access heighten women's vulnerability to climate change, particularly during the extreme climate events. Overcrowded and insecure shelters exacerbate the situation, often leading to gender-based violence following the natural disaster, which has increased intensity due to the impacts of climate change. The gendered impacts of climate change are significant, with women facing increased risks due to limited access to medical care, privacy, security, along with special needs which has been overlooked across the emergency health service provision. Special needs of women like essential hygiene products, including sanitary napkins and contraceptives are not being available to the marginalized community, who are the most vulnerable. Drought, salinity intrusion, river erosion and such impacts results in displacement of population, causing social discrimination such as child marriage and other implications. According to the 6th Assessment report of IPCC In 2019, maternal and neonatal disorders were responsible for 3.7% of global deaths and 7.8% of Disability-Adjusted Life Years (DALYs), highlighting their significant health impact. Children and pregnant women are particularly vulnerable to climate-related risks, including extreme weather events and undernutrition, which can lead to higher rates of pre-term births, low birthweight, stillbirth, and neonatal stress. Furthermore, extreme weather conditions can severely limit access to prenatal and pediatric healthcare services, including prenatal care and attended childbirth, exacerbating the health risks for both mothers and their children.

2.3.7 Extreme Heat Events and its impact

Research from 2003 to 2007 indicates that in Bangladesh, heatwaves typically strike between April and June, with May being the most severe month. On average, these heatwaves have led to approximately 1,500 deaths annually, with a particularly severe episode in 2005 causing over 3,800 deaths. Studies also show that heatwaves pose significant risks to the food system, affecting food security and thereby impacting human health. The investigation into this issue has revealed that the physical effects of heatwaves on food systems, especially concerning dietary implications and the prevalence of food-borne illnesses within tribal populations, can have detrimental health outcomes. (Arrighi, 2017, Rahman, 2024)

2.3.8 Climate Change Impacts on Mental Health

Climate change can also have significant indirect effects on the psycho-social well-being of individuals and communities (Berry et al. 2010). Extreme weather events have a profound impact on affected populations in Bangladesh, leading to adverse influences on mental health through various pathways, including declining income from agriculture production, displacement, and post-traumatic circumstances. The 2012 Vulnerability and Adaptation Assessment examined the relationship between mental health and climate change using hospital admissions records for various mental health disorders, meteorological data, and disaster information (CCHP, 2012). Although results are inconclusive, this was a step forward in better understanding the link between climate change and mental health in Bangladesh and further research is needed, especially concerning drought situations. Overall, mental health remains a low priority for the health sector, however with the impacts of

climate change potentially increasing the risk of mental health disorders additionally resources are needed.

3 Review of H-NAP in Global NAPs

3.1 National Adaptation Plan of Armenia

On 10 September 2015, The Government of the Republic of Armenia identified seven sectors with particular adaptation needs: (a) natural ecosystems (aquatic and terrestrial, including forest ecosystems, biodiversity and land cover), **(b) human health**, (c) water resources management, (d) agriculture, including fisheries and forests, (e) energy, (f) human settlements and infrastructure, and (g) tourism. The vision of the NAP is to consider the vulnerable impacts of climate change, particularly to the following sectors, incorporating climate change adaptation consideration.

The NAP of Armenia 2021-2025 consists of two sets of implementable measures. Among these, health is a priority in the second set of adaptation measures.

3.2 National Adaptation Plan of Brazil

To increase the climate resilience, the NAP of Brazil identified 11 thematic sectors, namely Agriculture, Biodiversity and Ecosystems, Cities, Disasters, Industry and Mining, Infrastructure (Electric Power, Transport and Urban Mobility), Vulnerable Populations, Water Resources, Health, Food and Nutritional Security, and Coastal Zones.

3.3 National Adaptation Plan of Burkina Faso

The vision of the Burkina Faso NAP reads: "Burkina Faso intends to manage its economic and social development more efficiently by implementing planning mechanisms and measures taking account of resilience and adaptation to climate change between now and 2050".

The long-term adaptation objectives based on that vision are to:

- protect accelerated growth pillars;
- ensure sustainable food and nutrition security;
- preserve water resources and improve access to sanitation;
- protect persons and goods from extreme climate events and natural disasters;
- protect and improve the functioning of natural ecosystems;
- protect and improve public health

3.4 National Adaptation Plan of Cabo Verde

In the NAP of Cabo Verde, health and nutrition & food security are considered as two of the six sectors as vulnerable to climate risks.

3.5 National Adaptation Plan of Chad

The National Adaptation Plan (NAP) of Chad outlines the country's strategy and actions to address the adverse impacts of climate change and enhance resilience to its effects by providing a framework to prioritize and implement adaptation actions to reduce vulnerability to climate change and build resilience in key sectors and communities across the country. Additionally, it reinforces the long-term perspective and links between adaptation priorities, sustainable development needs and the National Development Plan.

3.6 National Adaptation Plan of Congo

The objective of this National Adaptation Plan to Climate Change (NAP) of the Democratic Republic of the Congo (DRC) is to guide initiatives for the management and reduction of long-term climate risks in the country.

3.7 National Adaptation Plan of Ethiopia

Ethiopia's National Adaptation Plan (NAP-ETH) builds upon existing climate change initiatives, such as the Climate Resilient Green Economy strategy and sector-specific resilience plans. It aims to reduce the vulnerability of climate change impacts by integrating adaptation measures into long-term development pathways. NAP-ETH emphasizes effective governance, financing, capacity building, and disaster risk management. Guided by principles of participation, coherence, gender sensitivity, and partnership, the plan focuses on vulnerable sectors such as agriculture, forestry, health, transportation, energy, industry, water, and urban development.

3.8 National Adaptation Plan of Fiji

The NAP will support efforts to achieve Goal 3 which is to ensure healthy lives and promote wellbeing for all at all ages. It achieves this through the section on health which will support efforts to reduce the spread of tropical diseases and non-communicable diseases. The inclusion of health as a sector within the NAP is paramount due to Section 38 of the 2013 Constitution of the Republic of Fiji which requires the State to take 'reasonable measures within its available resources to achieve the progressive realization of the right of every person to health, and to the conditions and facilities necessary to good health, and to health care services, including reproductive health care'.

3.9 National Adaptation Plan of Grenada

The Ministry of Health and Social Security "Corporate Plan" for 2015-2017 was drafted in 2014, providing a road-map for MoHSS programs and activities, and outlining priority areas for health spending in that period⁵⁶. While the Corporate Plan does not explicitly mention specific climate change activities, the SWOT analysis undertaken to develop the plan does identify climate change as a threat to national health. As part of a SMART health care facilities project, health facilities are being assessed in their infrastructure, services, disaster safety, as well as water.

3.10 National Adaptation Plan of Japan

The government of SVG has sought to deliver proper health care based on the needs of its citizens. To achieve this goal, the Ministry of Health, Wellness and the Environment (MOHWE) is pursuing preventive medicine through public education. The country is divided into nine health districts served by one general hospital, one mental hospital, five district hospitals, two nursing homes, and forty health centers (outpatient clinics). Additionally, there is one private hospital that works in tandem with the state facilities to deliver what the Pan American Health Organization (PAHO) considers adequate health coverage for the country.

3.11 National Adaptation Plan of Kenya

Kenya's recent improvements in malarial control, water-borne diseases, infant mortality and malnutrition are vulnerable to setbacks from climate change. Impacts on water quality, water resources, changes in habitat, increasing exposure of vulnerable groups, sanitation and drainage, and

vector-borne diseases are all areas for concern. These and many other potential impacts require not only continued investment and focus on climate sensitive health issues, but also full integration of climate change into Kenya's many existing health programs and policies.

3.12 National Adaptation Plan of Kiribati

Kiribati Joint Implementation Plan has 12 major strategies. Two of these are:

- Increasing water and food security with integrated and sector-specific approaches and promoting healthy and resilient ecosystems.
- Strengthening health service delivery to address climate change impacts.

3.13 National Adaptation Plan of Kuwait

The overall objective of the National Adaptation Plan (NAP) of Kuwait is to provide an integrated development plan and subsequent programmes targeting local communities and environmental components in areas under the threat of climate change. NAP covers **four** sectors: Marine and fisheries, water resources, coastal zone, and health.

3.14 National Adaptation Plan of Liberia

The objectives for the NAP document are to:

- Provide a framework and procedures for sharing of information of scientific, technical, and traditional knowledge on climate change risk management and develop capacity-building measures;
- Coordinate sectors and related government and private land-use institutions on climate change risk management using awareness with a focus on the improvement of climate risk management actions and
- Work with the priority sectors to identify and propose measures to promote adaptation to reduce climate change risk.

In the NAP of Liberia, health is mentioned as one of the climate-sensitive factors.

3.15 National Adaptation Plan of Nepal

The formulation of the National Adaptation Plan (NAP) of Nepal aims to support the country in adapting to the impacts of Climate Change through (i) short-term priority actions (until 2025), (ii) medium-term priority programmes (until 2030) and (iii) long-term adaptation strategic goals (until 2050). Its objective is to enhance the incorporation of actions and strategies in addressing climate risk and vulnerability in development planning and implementation in the country. The short-term and medium-term actions are designed to help the Government of Nepal achieve the adaptation actions set out in its 2020 Nationally Determined Contribution (NDC). Nepal's NAP process aligns with the key principles of the 2030 Agenda, including the commitment to leave no one behind. Moreover, the priority thematic areas identified in this NAP directly corresponds to the Sustainable Development Goals (SDGs).

3.16 National Adaptation Plan of Palestine

The National Adaptation Plan (NAP) of the State of Palestine identifies water and food security as top priorities, affecting multiple sectors such as agriculture, coastal and marine environments, energy, gender equality, public health, industry, terrestrial ecosystems, tourism, urban development and infrastructure as well as waste and waste water management.

3.17 National Adaptation Plan of Sierra Leone

Sierra Leone has one of the highest malnutrition and child mortality rates in the world, making the country's population extremely vulnerable to climate shocks. Incidents of high-temperature morbidity and mortality are projected to increase. Rising temperatures are also associated with increased episodes of diarrhoeal diseases, seafood poisoning and increases in dangerous pollutants. As temperatures increase above 25°C, malaria infection is expected to rise. The country's Ebola outbreak revealed a deficient health system, including understaffed, unavailable, or unaffordable health care that will be further stressed by climate change impacts (USAID, 2016).

3.18 National Adaptation Plan of South Africa

Health is considered a priority adaptation-related sector for South Africa, as identified in the NCCRP.

3.19 National Adaptation Plan of South Sudan

The objectives of the NAP are:

To reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience;
To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes, and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

The NAP of South Sudan identified health as one of the prioritized sectors.

3.20 National Adaptation Plan of Sudan

Sudan's Initial National Communication identified agriculture, water and health as the highest priority sectors where urgent and immediate adaptation action is needed to confront increasing climatic variability and climate change.

3.21 National Adaptation Plan of Timor Leste

The HNAP was produced by the Ministry of Health and is currently being finalized. The HNAP provides some baseline information on health indicators and describes the primary threats to health associated with changing climate and environmental conditions. The HNAP acknowledges the need for intersectoral coordination since some environmental health issues are not within the control of MoH. The HNAP provides the overall strategic direction for strengthening health systems to protect health from climate change. It identifies and addresses medium- and long-term adaptation needs, including upstream drivers of health risks, taking into consideration the physical, social, and biological determinants of health. It is envisaged that the HNAP will facilitate increased access to climate adaptation finance by identifying entry points in the health sector.

3.22 National Adaptation Plan of Suriname

The Republic of Suriname plays a significant role in mitigating the adverse impacts of climate change as it is known as the most forested country globally. In alignment with the Sustainable Development Goals, Suriname has developed its National Adaptation Plan (NAP) as a national initiative to effectively tackle climate-related challenges while advancing sustainable development. The primary aim of the NAP is to facilitate comprehensive medium and long-term climate adaptation planning in Suriname. The objectives of the NAP are:

- To reduce the impacts of climate change through adaptation and resilience-building measures
- To ensure the integration and mainstreaming of climate change considerations into relevant new and existing policies, programs, activities, and development planning processes and strategies across various sectors and levels as appropriate.

3.23 National Adaptation Plan of Sri Lanka

Sri Lanka has reported relatively high achievements in the health sector compared with other developing nations. The country has recently experienced an outbreak of diseases that are closely connected with the environment and weather patterns. Sri Lanka has an ageing population which would particularly be vulnerable to climate-related health hazards. Hence, serious effort towards adaptation against potential health hazards associated with climate change is a priority.

3.24 National Adaptation Plan of St Lucia

Saint Lucia's National Adaptation Plan (NAP) has been defined as a ten year process (2018-2028), consisting of priority cross-sectoral and sectoral adaptation measures for eight key sectors/areas. The NAP of St. Lucia will function as a mechanism to:

- Guide the integration of climate change adaptation considerations into decision-making processes.
- Raise awareness and provide information on climate change projections, vulnerabilities, and proposed solutions to foster collaboration among government institutions.
- Encourage the engagement of national non-state actors in adaptation efforts and stimulate autonomous initiatives.
- Mobilize resources, both national and international, for adaptation endeavors.

3.25 Joint National Action Plan of Tonga

The Joint National Action Plan of Tonga is a coordinated strategy aimed at addressing climate change challenges and promoting sustainable development. Key elements of the plan include:

- Joint action among government agencies, civil society, and other stakeholders to tackle issues related to climate change.
- Building resilience to climate change impacts through measures such as enhancing infrastructure, strengthening disaster preparedness, and promoting sustainable land and water management.

- Initiatives to reduce greenhouse gas emissions and promote renewable energy sources to mitigate climate change.
- Strengthening institutional capacity and provide training and education on climate change adaptation and mitigation.
- Engaging local communities in climate change initiatives to ensure their participation and ownership.
- Mechanisms for monitoring progress and evaluating the effectiveness of actions are integrated into the plan to ensure accountability and continuous improvement.

4 C3HNAP Priorities

4.1 Past Initiatives

4.1.1 Past Initiative: C3HNAP

The Health Service Division of the Ministry of Health and Family Welfare, under the coordination of the Climate Change and Health Promotion Unit (CCHPU), successfully conducted four divisional workshops in Barishal, Khulna, Chittagong, and Sylhet. These workshops were significant gatherings, bringing together divisional directors, civil surgeons, upazila health and family planning officers, and other health service system representatives. Participants engaged in critical discussions, identifying the specific vulnerabilities of their respective divisions to climate change. They also explored various pathways to enhance climate resilience within the health sector. A key focus of these workshops was the emphasis on the urgent need for research and the development of policies tailored to address the multifaceted challenges posed by climate change and its impact on public health. This initiative marked a proactive step towards integrating climate considerations into the national health policy and planning framework, demonstrating a comprehensive approach to building a resilient health service system in the face of climate change.

4.2 C3HNAP Preference

The C3HNAP Preferences in Bangladesh reflect a commitment to developing a health sector that can resiliently respond to the challenges posed by climate change without hampering the developments and the milestones achieved by the remarkable health sector in Bangladesh. Bangladesh has achieved outstanding milestones, but the impact of climate change poses a challenge to erode of the achievements. Recognizing the intricate link between climate change and health, Bangladesh aims to prioritize adaptation measures that not only address immediate health concerns arising from climate-related events but also build a resilient health infrastructure. Enhancing disease surveillance systems from local to national to enhance the preparedness to manage climate-sensitive health risks such as vector-borne and water-borne diseases, and nutritional deficiencies caused by impacts on agriculture. Another significant preference is the mainstreaming of climate change considerations into all levels of health planning and service delivery, ensuring that health service providers across all the levels are equipped with the knowledge and resources to address climate-related health challenges. Strengthening community-based health interventions is also highlighted, acknowledging the importance of local knowledge and action in adapting to climate change. Addressing the special needs of the vulnerable communities like women, children, elderly and persons with disability are also being considered as preference to ensure the reproductive health as well as adolescent health's are being properly addressed. These preferences underline a comprehensive approach, focusing on building both the adaptive capacity of the health sector and the resilience of communities it serves.

4.3 C3HNAP Strategy

The C3HNAP Strategies provide a detailed roadmap for achieving the outlined preferences and navigating the identified pathways. Key strategies include the development and implementation of climate-resilient health policies and programs that are integrated into national and local health planning processes. This involves revising existing health policies to incorporate climate change adaptation measures and creating new policies where necessary. Strengthening surveillance and early warning systems for climate-sensitive health outcomes is a strategic priority, aimed at enabling timely and effective responses to health emergencies. The strategies also emphasize the importance of building the capacity of health workers through targeted training programs and developing public

education campaigns to raise awareness about climate change and health. Investing in climate-resilient health infrastructure, such as building flood-resistant health facilities and ensuring the availability of clean water and sanitation in health centers, is another strategic focus. The document also highlights the need for enhanced collaboration with international partners to access technical and financial resources for implementing the C3HNAP

Table: 3.2: Strategies of the C3HNAP

Strategic Focus	Goal	Adaptation Strategy
Climate Transformative Leadership and Governance	Strengthen health sector leadership, governance and coordination roles	• Collaboration with other sectors relevant to health, environment and climate change • Integration of climate change into relevant departments and agencies • Provide resources to Climate Change and Health Planning Unit (CCHPU)
Climate Smart Health Work force	Strengthening of technical and professional capacity of health professionals at different tiers of health system on climate change and health	• Training on climate change and health for health professionals at different tiers
Assessment of climate and health risks	Assessment of potential health impacts of climate change and identifying adaptation options.	• Conducting vulnerability assessments and formulating adaptation strategies for health systems in response to future climate change
Intergrated Risks monitoring and early warning	Strengthening integrated disease surveillance and early warning system	• Improve disease surveillance, early warning systems communication to health decision maker Effectively communicating health risks to the media and public and translating them into action to prevent negative health outcomes.
Health and climate research	Conducting comprehensive research on climate change and health to facilitate the developments of targeted strategies	• Basic Research on climate change and health • Applied Research for innovation on climate resilient infrastructure, improved health and WASH Technologies • Establishment of climate resilient health care facilities for improved human well-being and livability

Strategic Focus	Goal	Adaptation Strategy
Climate resilient and low carbon infrastructure, technologies and supply chain	Implementation of National WSP at all health facilities	• Maintain safe water supply systems in accordance to WSP and established guidelines and standards
Management of environmental determinants of health	Establishment of multisectoral risk management frameworks to address health risk	• Implementing integrated risk management strategies across multiple sector to mitigate and manage health risks
Climate informed health programmes	Strategic planning of health programmes for climate sensitive disease	• Planning of health programmes for diseases such as Vector borne disease, zoonotic diseases), NCD (Heart disease, COPD), nutrition • Development of heatwaves and disaster outbreak advisory services for city dwellers • Develop contingency plans for healthcare provision in extreme weather events or delivery of interventions to control outbreak of infectious diseases
Climate Related Emergency Preparedness and Management	Develop health Sector emergency response plans for extreme weather events including risk reduction, preparedness and response from work	• Allocate resources for addressing health impacts of climate variability
Sustainable Climate and Health Financing	Ensure adequate resources to address the health impact of climate variability and climate change as a line item in national health investment	• Explore international funding sources for building climate resilient health systems

C3HNAP Integration with NAP Interventions

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
Long-term HNAP strategic objective				
To build resilience to climate change impacts on health by empowering communities and individuals through an adaptive and sustainable health system in Bangladesh				
Component 1: Climate Transformative Leadership and Governance				
Goal: Strengthen health sector leadership, governance and coordination roles				
Collaboration with other sectors relevant to health, environment, and climate change	PIN 2	Development of a regulatory and institutional framework for advancing the NAP	S6.1, S6.2, S6.3, S6.4, S6.5	Lead: MoH&FW; Others: MoEFCC, MoDMR, MoSW other relevant
Integration of climate change into relevant departments and agencies to contribute into the integration of health in Nationally Determined Contribution (NDC) and Long Term Low Emission Development Strategy (LT-LEDS)	PIN 3	Update and reform policies and plans for mainstreaming climate change adaptation	S6.1, S6.2, S6.3, S6.4, S6.5	Lead: MoH&FW Others: MoF, MoEFCC, DPHE, WASAs, DGHS, Municipalities, DDM, CCHPU MoYS, MoLIPA, MoWCA, MoCHTA, MoLGRDC, MoWR, MoA, MoFL, MoWCA, MoDMR, Cabinet Division, PMO and other relevant ministries, private sectors, NGOs, CBOs, CSOs
Establishment of Climate Change and Health Promotion Unit as National Coordination Agency for Climate Change and Health Protection with specific budgets	PIN 4	Operationalize the NAP monitoring, evaluation and learning framework based on a theory of change.	S5.1, S5.3	Lead: MoH&FW Other: CCHP Unit, MoEFCC, IMED MoP, Cabinet Division, PMO, all relevant ministries and line agencies, PPPA, private sector
Component 2: Climate Smart Health workforce				
Goal: Strengthening of technical and professional capacity of health professionals at different tiers of health system on climate change and health				
Policy and decision-makers with better awareness and understanding of CC&H	CDR 1	Transformative capacity development and knowledge management for integrating climate	S6.1, S6.2, S6.3, S6.4, S6.5	Lead: MoHFW

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
issues to make climate smart decisions for organizational development		change adaptation into planning processes and climate financing		Other:MoEFCC, MoP,MoF, IEDCR, ICDDR-B Cabinet Division, PMO, government and nongovernmental knowledge and training institutes like CreLIC, CECCR, NILG, BPATC, CEGIS, etc., MoPA,privatesector,universities, academia
Health professionals with better awareness and understanding of CC&H issues	CDR 2	Awareness raising, training on skills for enhanced adaptive capacities and improved diversified livelihoods at the community level	S6.1, S6.2, S6.3, S6.4, S6.5	Lead: CCHPU Other MoH&FW, DGHS CDC, IEDCR, NCDC, PHC), , ICDDR-B, BMD, SPARRSO, ICT, CEGIS, knowledge institutes, academia, universities, BFD, SoB, MoA, MoFL, MoLGRDC, Mol, MoS, CHTDB, BMDA, DBHWD, WARPO,BWDB, FFWC
Communities with better awareness and understanding of CC&H issues	CDR 4	Capacity Development for the implementation of nature based solutions and locally led adaptation	S6.1, S6.2, S6.3, S6.4, S6.5	Lead: Bureau of Health Education (BHU) Other:MoH&FW, DGHS (CDC, IEDCR, NCDC, PHC), City Corporation, DGHS (BHE), IPH, IEDCR, NIPSOM
Component 3: Assessment of Climate and Health Risks				
Goal: Assessment of potential health impacts of climate change and identifying adaptation options				
Identification of health risks due to impact of climate change with the goal of developing climate smart interventions	CDR 5	Generation of national, regional and local-level evidence and scenario-based climate information through climate downscaling and publication of a national climate outlook, risk and vulnerability atlas	S6.1, S6.2, S6.3, S6.4, S6.5	Lead: MoH&FW Other: CCHPU, DGHS CDC, IEDCR, NCDC, PHC), , ICDDR-B, BMD, SPARRSO, ICT, CEGIS, knowledge institutes, academia, universities, BFD, SoB, MoA, MoFL, MoLGRDC, Mol, MoS, CHTDB, BMDA, DBHWD, WARPO,BWDB, FFWC
Integration of adaptation strategies into national climate policy and position papers for climate negotiations				
Component 4: Integrated risk monitoring and early warning				
Goal: Strengthening integrated disease surveillance and early warning system				

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
Integration of early warning system mechanism with disease surveillance	CRC9	Improvement of surveillance, early warning systems and monitoring of psychosocial impacts and mental health risks from extreme weather events	S3.2, S3.3, S1.2, S1.3, S4.1, S4.2, S4.3	Lead: MoHFW Other: ICCDRB, IEDCR, BMD, SPARRSO, WARPO, DWA, DYD, DSS, CEGIS, LGD, DoE, BIDA, PPPA, ICT, private sector
	CDM 3	Implementation of thunderstorm and lightning risk management measures in highly susceptible areas	S1.3, S2.4, S2.1, S2.2	Lead : DDM Others : LGD, LGED, RHD, DBHWD, PWD, MDA, DAE, CHTDB, MoD, PPPA, private sector
	CDM 2	Landslide early warning systems and risk management measures based on eco- or bioengineering measures	S1.3, S4.2, S4.3	Lead : DDM Others: CHTDB, RHD, LGED, DoE, BFD, BRB, BMD, SPARRSO, DBHWD, PPPA, MoD, private sector
	WRM 2	Development of a national drought monitoring system	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3, S2.4	Lead: BARC Others: BMDA, CHTDB, BMD, SPARRSO, BWDB, LGED, WARPO, SRDI, DPHE, DBHWD, CEGIS, DDM, PPPA, private sector
	WRM 11	Erosion risk management through erosion prediction, improved early warning and its dissemination	S1.2, S1.3, S4.1, S2.1, S2.2, S2.3, S2.4	Lead: BWDB Others: WARPO, CEGIS, FFWC, ICT, LGED, RHD, LGIs, BMD, SPARRSO, DDM, BFD, PPPA, private Sector
Climate-informed health early warning system for policy makers developed for climate-sensitive diseases	WRM 4	Strengthen early warning and dissemination services for climate change induced slow onset and	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3,	Lead: IEDCR Other: BMD, DGHS (CDC), DPHE, ICDDR-B DoE, DAE, NARS institutes,

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
		sudden extreme water hazards using ICT and artificial intelligence	S2.4	BFD, DoF, BFRI, DDM, DLS, BLRI, SRDI, SPARRSO, CHTDB, BMDA, ICT, PPPA, private sector
	CRC 12	Development of heatwave and disease outbreak advisory services for city dwellers	S3.2, S3.3, S1.2, S1.3	Lead : DGHS Others : ICCDRB, IEDCR, BMD, SPARRSO, WARPO, CEGIS, LGD, DoE, BIDA, PPPA, ICT, private sector, DSW, MoWCA
Effectively communicating health risks to the media and public with translating to action to prevent negative health impacts	CDR 3	Coordinated research, fieldlevel demonstrations, knowledge management and communication of adaptation at the local level	S6.1, S6.2, S6.3, S6.4, S6.5	Lead: IEDCR Other: DGHS (CDC, NCDC, PHC), MoE, NNS, IPHN, BNNC, NIPSOM, ICMH City Corporation, ICDDR-B
Component 5: Health and climate research				
Goal: Conducting comprehensive research on climate change and health to facilitate the developments of targeted strategies				
Enhanced climate change and health research prioritizing on innovation for the establishment of climate resilient health system	CDR 10	Action research for locally led and indigenous climate change adaptation	S6.1, S6.2, S6.3, S6.4, S6.5	<i>Lead:</i> CCHPU <i>Other:</i> DGHS, CCHPU, ICDDR-B, NIPSOM, NIPORT, academia, universities
Innovation to implement low carbon health facilities to ensure sustainability and environmental health	CDR 12	Research on climate change impacts on land, water and ocean ecosystems	S6.1, S6.2, S6.3, S6.4, S6.5	<i>Lead:</i> CCHPU; <i>Other:</i> DGHS, DOE, IDCOL, Carbon Trading Organizations
Enhancement of research capacity with focus to transform research into policy implementation	CDR 14	Research on and piloting of climate resilient infrastructure, improved health measures and WASH technologies	S6.1, S6.2, S6.4, S6.5	<i>Lead:</i> CCHPU; <i>Other:</i> DGHS CDC, IEDCR, NCDC, PHC), City Corporation, NGO Forum for Public Health
Component 6: Climate resilient and low carbon infrastructures, technologies and supply chain				
Goal: Implementation of Integrated Smart Logistic Management for Climate Resilience and Low carbon emission				
Vulnerability of healthcare facilities identified and addressed	CDR 15	Action research for low-impact development techniques, green infrastructure and integrated drainage management for smart city development	S6.1, S6.2, S6.4, S6.5	Lead : DGHS Others: BFD, DoE, UDD, HBRI, PWD, LGED, RHD, BWDB, WARPO, DBHWD,

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
				BMD, knowledge institutes, academia, universities, private sector
Climate resilient logistic management system implementation in the climate vulnerable areas	WRM 3	Protection and management of potentially vulnerable areas due to tropical cyclone, sealevel rise, extreme storm surges and flooding	S1.1, S1.2, S1.3, S4.1, S4.3, S2.1, S2.2, S2.3, S2.4	<i>Lead:</i> CCHPU <i>Other:</i> MoH&FWDisaster Management Bureau; Water Resources; BMD; DPHE,
Develop logistical adequacy to tackle short term as well as long term impacts of climate change on health and well-being				
Component 7: Management of environmental determinants of health				
Goal: Establishment of multisectoral risk management framework to address health risks				
Water safety plan strengthened and safe water and sanitation for healthcare facilities ensured	WRM 2	Management of Freshwater resources and monitoring of salinity for reducing vulnerabilities in existing and potential salinity-prone areas	S1.1, S1.3, S4.1, S4.2, S2.1, S2.2, S2.3, S2.4	<i>Lead:</i> BWDB <i>Other:</i> LGED, RHD, DoE,DAE, NARSinstitutes, BFD,DoF, BFRI, DDM,DLS, DPHE, BLRI, LGD,DYD,DSS,DWA,SRDI,BMD,SPARRS O, WARPO, DBHWD, SoB, MoL, PPPA, private sector, NGOs
	WRM 1	Integrated management of coastal polders, sea dikes and cyclone shelters against tropical cyclone, sealevel rise and storm surges	S1.1, S1.3, S4.1, S4.2, S4.3, S2.1, S2.2, S2.3, S2.4	Lead : BWBD Others: LGED, RHD, DoE, DAE, NARS institutes, BFD, DoF, BFRI, DDM, DLS, DPHE, BLRI, LGD, DYD, DSS, DWA, SRDI, BMD, SPARRSO, MoD,

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
				WARPO, DBHWD, MoL PPPA, private sector, NGOs
	WRM 5	Community based Rainwater harvesting through indigenous techniques and conservation of wetlands, reservoirs and natural springs for drinking water supplies in hard-to reach and water-stressed areas	S1.1, S1.3, S4.1, S4.2, S2.1, S2.2, S2.3, S2.4	Lead : BWDB, BMDA,LGD,CHTDB Others : DoE, DDM, DLS, DPHE, BLRI, LGD, DYD, DSS, DWA, SRDI, BMD, SPARRSO, WARPO, DBHWD, PPPA, private sector, NGOs
Integrated air quality monitoring developed to reduce the disease burden of Non-communicable diseases	CDR 11	Action research for developing and exploring the potential use of ecosystem based adaptation and nature- based solutions	S6.1, S6.2, S6.3, S6.4, S6.5	<i>Lead:</i> MoEFCC <i>Other:</i> Research centres, all relevant ministries and line agencies, knowledge institutes like CEGIS, academia, universities, private sector
Build a coordinated cross-sectoral management for policy development and implementation to ensure sustainable environment for health and wellbeing	PIN 5	Reform local Government institutes towards the inclusion of community-based organizations, women, people with disabilities and youth in the implementation of locally led adaptation	S5.1, S5.4	Lead: MoHFW Others: MoSW, MoDMR, MoE, MoEFCC MoEFCC, DSW, MoWCA, Cabinet Division, PMO, all relevant ministries and line agencies, PPPA, private sector
Component 8: Climate-informed health programmes				

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
Goal: Strategic Planning of health programmes for climate sensitive diseases				
Climate risks included in planning and implementation of climate-sensitive diseases (VBD, WBD, nutrition/food security)	CDR 3	Coordinated research, field level demonstrations, knowledge management and communication of adaptation at the local level	S6.1, S6.2, S6.3, S6.4, S6.5	<i>Lead:</i> MoH&FW <i>Other:</i> All relevant ministries, line agencies dedicated to service extension, the private sector, academia, universities
Health programme focused Intervention delivery mechanism to be developed	CDM 7	Behavioural change and development of awareness among vulnerable communities for emergency responses and livelihood protection from climate-induced disasters	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3	<i>Lead:</i> CCHPU <i>Other:</i> MoH&FW CCHP Unit; IEDCR, NNS, IPHN, BNNC, NIPSOM, ICMH, ICDDR-B
Component 9: Emergency preparedness and management				
Goal: Emergency Preparedness and Management				
Climate change and health risks included in disaster risk management plans	CDM 5	Gender-, age- and Disability responsive, youth led disaster preparedness and emergency rescue and evacuation services	S1.1, S1.2, S1.3	<i>Lead:</i> MIS <i>Other:</i> MoH DGHS, Disaster Management, Hydro-Met Services. DOE, BMD, DPHE
Component 10: Sustainable Climate and health financing				
Goal: Ensure Adequate resources to address the health impacts of climate variability and climate change as a line item in national health investment				
Fund mobilized for adaptation and mitigation measures	PIN 6	Innovative, Appropriate and enhanced financial instruments for supporting climate change adaptation	S5.1, S5.3, S5.5	<i>Lead :</i> MoF <i>Others :</i> NBR, BB, MoEFCC, Cabinet Division, PMO, PPPA, private sector

Deliverable	NAP Code	NAP Interventions	NAP Strategy	Responsible institutions
	PIN 7	Private sector finance in leading the implementation of climate change adaptation	S5.3, S5.5	<i>Lead:</i> MoF <i>Other:</i> NBR, BB, MoEFCC, Cabinet Division, PMO, PPPA, private sector

Table 3.3: Integration of Health in the proposed Intervention of NAP (2021-2050)

Code	Interventions for NAP sectors	Domain7	NAP strategy	Integration of health
Sector:	Water resources			
WRM1	Integrated management of coastal polders, sea dikes and cyclone shelters against tropical cyclone, sea-level rise and storm surges	SWM SEE CHI	S1.1, S1.3, S4.1, S4.2, S4.3, S2.1, S2.2, S2.3, S2.4	Health Infrastructure
WRM2	Management of freshwater resources and monitoring of salinity for reducing vulnerabilities in existing and potential salinity-prone areas	SWM SEE CHI	S1.1, S1.3, S4.1, S4.2, S2.1, S2.2, S2.3, S2.4	Water-borne Diseases
WRM3	Protection and management of potentially vulnerable areas due to sea-level rise, tropical cyclone, extreme storm surges and flooding	SWM SEE CHI	S1.1, S1.2, S1.3, S4.1, S4.3, S2.1, S2.2, S2.3, S2.4	Water-borne Diseases
WRM5	Community-based rainwater harvesting through indigenous techniques and conservation of wetlands, reservoirs and natural springs for drinking water supplies in hard-to-reach and water-stressed areas	SWM SEE CHT DBA CBL NNW CHI URB	S1.1, S1.3, S4.1, S4.2, S2.1, S2.2, S2.3, S2.4	Water-borne Diseases
WRM8	Drainage management of economic/industrial zones and critical infrastructure, and reinforced climate resilience through risk assessment	SWM SEE FPE HFF URB	S1.1, S1.2, S1.3, S4.1, S2.1, S2.2, S2.3, S2.4	Health Infrastructure
WRM13	Reclamation and development of lands for the expansion of afforestation, agriculture, shrimp cultivation and settlements	SEE CHI	S1.3, , S4.1, S4.2, S4.3, S2.1, S2.2, S2.3, S2.4	Food Security

Code	Interventions for NAP sectors	Domain7	NAP strategy	Integration of health
WRM16	Drought management measures for enhanced groundwater recharge and increased soil moisture in water-stressed areas	DBA NNW CBL CHT SWM	S1.2, S1.3, S4.1, S4.2, S2.1, S2.2, S2.3, S2.4	Food Security
Sector:	Disaster, social safety and security			
	Construction and rehabilitation of gender-, age- and disability-sensitive, multipurpose, climate-resilient and accessible cyclone and flood shelters with safe drinking water, sanitation and livestock shelter facilities	SWM SEE CHI FPE HFF	S1.1, S1.2, S1.3, S2.1, S2.2	Mental Health
CDM4	Protection and enhanced resilience of climate migrants with a particular focus on gender and disability	Nationwide	S1.1, S1.2, S1.3, S2.1, S2.2	Mental Health
CDM5	Gender-, age- and disability-responsive, youth-led disaster preparedness and emergency rescue and evacuation services	SWM SEE CHT FPE HFF CBL NNW CHI URB	S1.1, S1.2, S1.3	Mental Health
CDM6	Increase the resilience of vulnerable poor communities by introducing gender-, age- and disability-responsive diversified livelihoods, effective insurance mechanisms and climate resilience funds	Nationwide	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3	Mental Health
CDM7	Behavioral change and development of awareness among vulnerable communities for emergency responses and livelihood protection due to climate-induced disasters	Nationwide	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3	Mental Health
CDM8	Increase the coverage of social security/social safety net programmes for building community-based resilience and adaptive capacity	Nationwide	S1.1, S1.2, S1.3, S2.1, S2.2	Mental Health
CDM9	Halt child abuse, early marriage and domestic violence triggered by climate-induced disasters	Nationwide	S1.1, S1.2, S1.3	Mental Health
CDM10	Accelerated livelihood improvements for women, people with disabilities and young entrepreneurs through vocational training on adaptation practices and ICT	Nationwide	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3	Mental Health
CDM11	Introduction of risk transfer and insurance mechanisms for protection of critical and disaster protection infrastructure, vulnerable MSMEs and farmers	Nationwide	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3	Health Infrastructure, Mental Health

Code	Interventions for NAP sectors	Domain7	NAP strategy	Integration of health
CDM12	Building climate-resilient houses, education & communication infrastructure in areas with high climate risk	Nationwide	S1.1, S1.2, S1.3, S2.1, S2.2, S2.3	Health Infrastructure, Mental Health
Sector	Fisheries, aquaculture and livestock			
CFL4	Validation and extension of indigenous knowledge-based adaptation techniques to combat climatic effects on fisheries	SWM SEE CHT HFF DBA CBL NNW	S2.2, S2.4, S1.3, S4.1, S4.2	Mental Health
CFL7	Improvement of post-harvest facilities and e-commerce- based market facilities for fisheries and aquaculture	Nationwide	S2.2, S2.3, S1.3	Food borne Disease
CFL12	Climate-resilient infrastructure development for the safety of livestock and poultry during disasters	Nationwide	S2.2, S2.3, S1.3	Health Infrastructure, Food Security
Sector:	Ecosystems, wetlands and biodiversity			
EWB2	Community-based afforestation and reforestation for biodiversity conservation, enhancement of ecosystem resilience and increased carbon sequestration	Nationwide	S4.1, S4.2, S4.3, S1.1, S1.3	Airborne Disease
EWB3	Expand ecosystem-based adaptation for the restoration of mangroves, hill areas and wetlands to tackle the adverse impacts of climate change	Nationwide	S4.1, S4.2, S4.3, S1.2, S1.3	Health Security
EWB4	Strengthen ecosystem and biodiversity monitoring and law enforcement systems	Nationwide	S4.1, S4.2, S4.3, S1.3	Environmental Health
EWB13	Conservation of village common forests (VCFs) through community-based spring, watershed and agricultural landscape management, and soil conservation in the Chattogram Hill Tracts	CHT	S4.1, S4.2, S4.3, S1.2, S1.3	Water borne and Vector Born Diseases
Sector:	Urban areas			
CRC1	Improvement of natural and artificial stormwater drainage networks for reducing vulnerabilities to urban flooding and drainage congestion	URB	S3.1, S3.2, S1.2,	Water-borne Diseases
CRC2	Expansion and conservation of green and blue infrastructure for improvement of urban environments and drainage systems	URB	S3.1, S3.2, S1.2,	Health Infrastructure
CRC3	Stormwater management in cities through attenuating peak flow and allowing infiltration in line with the concept of low-impact development	URB	S3.1, S3.2, S1.2,	Safe Water, Water-borne Diseases

Code	Interventions for NAP sectors	Domain7	NAP strategy	Integration of health
CRC5	Expand innovative climate-resilient, gender-, age- and disability-sensitive WASH technologies and facilities for urban communities	URB	S3.2, S3.3, S1.2, S1.3	Hygiene, Water-borne Diseases
CRC6	Increase access to water supply, sanitation and hygiene services in cities for reducing exposure to flooding and waterborne diseases during or after extreme weather events	URB	S3.2, S3.3, S1.2, S1.3	Hygiene, Water-borne Diseases
CRC7	Adopt integrated water management for urban and peri- urban areas	URB	S3.1, S3.2, S1.2,	Water-borne Diseases
CRC8	Carry out initiatives to improve the well-being of children and youth and reduce the effects of climate stress	URB	S3.1, S3.2, S3.3,	Mental Health
CRC9	Improvement of surveillance, early warning systems and monitoring of psychosocial impacts and mental health risks from extreme weather events	URB	S3.2, S3.3, S1.2,	Mental Health
CRC10	Extension of resilient and eco-friendly materials and engagement of the private sector through incentives and tax rebates for climate-resilient infrastructure development in urban areas	URB	S3.1, S3.2, S3.3, S1.2, S1.3, S4.1, S4.2, S4.3	Health Infrastructure
CRC11	Establishment of climate-resilient health-care facilities in urban areas	URB	S3.2, S3.3, S1.2, S1.3, S4.2	Health Infrastructure
CRC12	Development of heatwave and disease outbreak advisory services for city dwellers	URB	S3.2, S3.3, S1.2, S1.3	Water/Air/Food Borne Disease
Sector: Policies and institutions				
PIN3	Update and reform policies and plans for mainstreaming CCA	Nationwide	S5.1, S5.2, S5.3, S5.4, S5.5	Health
PIN5	Reform local government institutes towards the inclusion of community-based organizations, women, people with disabilities and youth in the implementation of locally led adaptation	Nationwide	S5.1, S5.4	Health
PIN6	Innovative, appropriate and enhanced financial instruments for supporting CCA	Nationwide	S5.1, S5.3, S5.5	Health
PIN7	Private sector finance in leading CCA implementation	Nationwide	S5.3, S5.5	Health
Sector: Capacity development, research and innovation				

Code	Interventions for NAP sectors	Domain7	NAP strategy	Integration of health
CDR1	Transformative capacity development and knowledge management for integrating CCA into planning processes and climate financing	Nationwide	S6.1, S6.2, S6.3, S6.4, S6.5	Health
CDR2	Awareness-raising, training on skills for enhanced adaptive capacities and improved diversified livelihoods at the community level	Nationwide	S6.1, S6.2, S6.3, S6.4, S6.5	Health
CDR3	Coordinated research, field-level demonstrations, knowledge management and communication of adaptation at the local level	Nationwide	S6.1, S6.2, S6.3, S6.4, S6.5	Health
CDR4	Capacity development for the implementation of nature- based solutions and locally led adaptation	Nationwide	S6.1, S6.2, S6.3, S6.4, S6.5	Health
CDR5	Generation of national, regional and local-level evidence and scenario-based climate information through climate downscaling and publication of a national climate outlook, risk and vulnerability atlas	Nationwide	S6.1, S6.2, S6.3, S6.4, S6.5	Health
CDR14	Research on and piloting of climate-resilient infrastructure, improved health measures and WASH technologies	Nationwide	S6.1, S6.2, S6.4, S6.5	Health Infrastructure, Water-borne Diseases, Mental Health
CDR15	Action research for low-impact development techniques, green infrastructure and integrated drainage management for smart city development	Nationwide	S6.1, S6.2, S6.4, S6.5	Health Infrastructure, Water-borne Diseases, Mental Health

4.4 C3HNAP Pathways

The C3HNAP Pathways delineate the strategic approaches Bangladesh intends to follow to operationalize its health adaptation priorities. Central to these pathways is the establishment of a robust framework for inter-sectoral collaboration, acknowledging that the health impacts of climate change are multifaceted and require concerted efforts across various sectors such as water, sanitation, agriculture, and disaster risk management. Strengthening health systems to withstand the impacts of climate change involves enhancing infrastructure, ensuring the availability of essential medicines and healthcare services during and after climate-related events, and improving emergency preparedness and response capacities. Capacity building and knowledge sharing are emphasized, with a focus on training health care workers on climate change and health issues and promoting public awareness campaigns. Research and innovation form another critical pathway, with the plan calling for targeted research to fill gaps in understanding the nexus between climate change and health and the development of innovative solutions to mitigate health risks. Lastly, the pathways advocate for securing sustainable financing mechanisms to support the implementation of health adaptation strategies.

4.5 Alignment with Development Agenda/NAP

In the National Adaptation Plan (NAP) published in 2022, significant interventions such as CRC6, CRC8, CRC9, CRC11, CRC12, and CDR14, were proposed to enhance resilience against climate change, focusing on improving water supply, sanitation, and hygiene services in urban settings, alongside promoting the well-being of children and youth, and advancing surveillance and early warning systems for mental health risks. While these interventions mark crucial steps towards mitigating the impacts of climate change on health, the policy notably falls short in two critical areas: addressing the unique challenges faced by the rural health system and the comprehensive implementation of disease control and early warning systems across all regions.

For future improvement, it is imperative to extend the scope of the NAP to include specific strategies for bolstering the rural health infrastructure, which is often the most affected by climate-related events yet remains under-resourced. This should involve deploying mobile health units, enhancing local health workers' capacities, and ensuring that rural health facilities are equipped and resilient to climate impacts. Furthermore, a more integrated approach to disease control is needed, one that encompasses both urban and rural settings and leverages technology and community networks for broader surveillance coverage. Early warning systems must also be refined and expanded, ensuring they are accessible to all segments of the population, including those in remote areas, and that they provide actionable advisories for impending climate-induced health risks. By addressing these gaps, the NAP can foster a more inclusive and comprehensive strategy that ensures resilience across all communities, irrespective of their geographic or socio-economic status, against the backdrop of an increasingly unpredictable climate.

5 Implementation Strategies

To successfully accomplish the goals outlined in the C3HNAP, a comprehensive implementation strategy is needed. Building from the strategic objectives and health adaptation options described in Part 4, the implementation strategy guides key stakeholders on the various components needed to develop a climate-resilient health system. Importantly, the implementation strategy is careful to support the mainstreaming of climate change into existing health programmes and operational plans, rather than creating parallel systems. As noted, climate change will exacerbate existing health problems in Bangladesh, therefore the activities under the C3HNAP should complement and strengthen on-going health programmes. This requires effective coordination within the health sector, as well as with other sectors and the overall NAP process, to ensure priorities are aligned and health has a strong, consistent voice in national climate change adaptation and mitigation efforts. Additionally, financial constraints have been highlighted as a major barrier for implementation of health adaptation strategies, therefore a financial strategy will need to be developed to cost proposed adaptation options, integrate climate change and health into government budgets, access external financing streams, and mobilize resources.

5.1 Regulations, Institutions, and Coordination

5.1.1 Policies and regulations

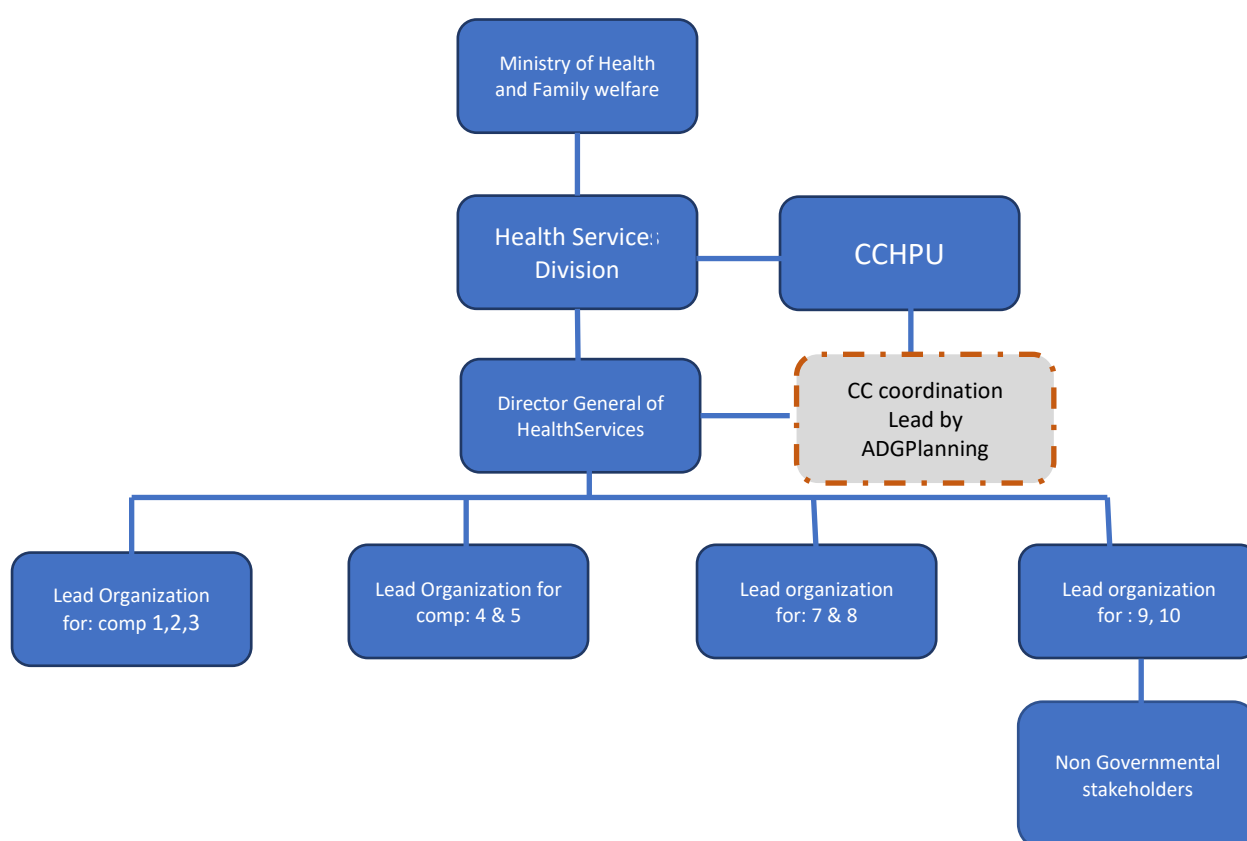
The implementation of the Health-National Adaptation Plan (C3HNAP) is underpinned by a robust framework of policies and regulations designed to ensure a cohesive and effective response to the health impacts of climate change. Central to this framework is the integration of climate adaptation goals into national health policies, thereby embedding climate resilience into the core of public health planning and service delivery. Regulations are set to enforce the development of climate-resilient healthcare facilities, guaranteeing that infrastructure improvements align with broader adaptation strategies. The framework mandates the establishment of surveillance and early warning systems for climate-sensitive diseases, ensuring timely and informed responses to emerging health threats. Additionally, it calls for the enhancement of water, sanitation, and hygiene (WASH) services, particularly in vulnerable communities, to reduce the risk of waterborne diseases. Cross-sectoral collaboration is emphasized, with policies promoting partnerships between the health sector and other relevant sectors such as environment, water resources, and disaster management, to ensure a holistic approach to health adaptation. Financial mechanisms are also outlined, including the allocation of funds and incentives for implementing climate-resilient health measures. These policies and regulations are designed not only to guide the immediate implementation of the C3HNAP but also to provide a sustainable foundation for ongoing adaptation efforts, ensuring that the health sector remains agile and responsive to the evolving challenges posed by climate change.

5.1.2 Institutional arrangements and coordination

The coordination of the C3HNAP is led by the Ministry of Health and Family Welfare, Climate Change and Health Promotion Unit. The CCHP unit has both an advisory group, which provides oversight for all CC&H activities, as well as technical working group, that is focused on the C3HNAP. This group will also link with the focal point for development of the NAP. Additionally, key stakeholders will support the implementation of the C3HNAP (a proposed list is in the Annex). Figure 7 provides a simplified diagram of the organizational structure. The coordination mechanism for implementation of the C3HNAP will be based on existing institutional arrangements and structures within the health sector to ensure alignment with national priorities. To ensure effective coordination, the C3HNAP will aim to strengthen the CCHP unit, as well as establish a specific C3HNAP task force, involving relevant

stakeholders across ministries, departments, and institutions that will lead the updating, monitoring, and evaluating progress.

Figure 3: Simplified institutional arrangements in the health sectors



5.2 Private Sector Engagement

The engagement of the private sector is pivotal in the successful implementation of the Health-National Adaptation Plan (C3HNAP), recognizing that a multi-faceted approach is essential to enhance the resilience of health systems to climate change. The private sector brings innovation, efficiency, and substantial resources that can complement public efforts in building climate-resilient health infrastructures, developing and deploying early warning systems, and enhancing disease surveillance mechanisms. The scope for private sector partnership extends across various domains, including technology firms for innovative health monitoring tools, pharmaceutical companies for ensuring the supply of essential medicines in climate-vulnerable areas, and infrastructure companies for the construction of resilient healthcare facilities. Strategies to foster these partnerships include creating policy incentives for investments in health adaptation projects, establishing public-private partnership (PPP) models tailored for health sector resilience, and facilitating platforms for knowledge and resource sharing between the government, non-governmental organizations, and private entities. By clearly delineating roles, responsibilities, and benefits for the private sector in the C3HNAP, and ensuring alignment with national climate adaptation goals, such collaborations can significantly amplify the impact and sustainability of health adaptation efforts, making the health sector more robust against the backdrop of changing climate patterns.

5.3 C3HNAP Financing Strategies

Bangladesh has established funds, the Bangladesh Climate Change Trust Fund (BCCT) to finance climate adaptation programmes and projects.

5.3.1 Bangladesh Climate Change Trust Fund

Bangladesh Climate Change Trust is a government statutory body under the Ministry of Environment, Forest and Climate Change. The Bangladesh Climate Change Trust (BCCT) was formed on January 24, 2013 in accordance with Section 3 of the Climate Change Trust Act-10.

Bangladesh Climate Change Trust (BCCT) has been serving secretarial duties to Trustee Board and Technical Committee formed under the Climate Change Trust Act, 2010 along with other activities of the Climate Change Trust Fund. A Managing Director with the rank of additional secretary is acting as a Chief Executive Officer of the Bangladesh Climate Change Trust.

Since its creation it has approved 43 government projects and 32 NGO projects, in total worth USD73.5 million. Some of these projects directly target the impacts of health on climate change, such as:

- Risk reduction and adaptation measures in the context of climate change impact on health sector in Bangladesh being conducted by the Health Promotion and Climate Change Unit of the Ministry of Health and Family Welfare
- Safe water supply, sanitation and bio-gas technology for rural livelihood improvement in climate victim people of Bangladesh being conducted by the Centre for Irrigation and Water Management
- Supplying of safe drinking water by solar desalinization/purification panel to the climate vulnerable areas of Bangladesh

5.3.2 Funding sources

5.3.2.1 *Internal*

The C3HNAP promotes and guides the mainstreaming of climate change into existing health and other relevant programmes, plans, and strategies, which should improve the ability to access internal Government funds. Completion of a costing exercise will provide evidence and information that will also advance the inclusion of climate change and health-related costs into operational plans and budget.

5.3.2.2 *External*

The C3HNAP action plan includes an activity to develop a resource mobilization plan. This plan provides the opportunity to identify key external funding sources to target, as well as the best way to access funds. Health, climate change, and climate change and health-related sectors (e.g. water, agriculture, etc.) funding streams should be included in the resource mobilization plan. The following sections highlight possible funding options.

Development Partners (DPs), including bilateral donors, multilateral and UN organizations and non-government organizations contribute a large proportion of climate finance and may be approached for initial funding to begin implementation of the C3HNAP.

The **UNFCCC** has some financing mechanisms which, are a significant international source of adaptation funding. The two funds (Adaptation Fund, and Green Climate Fund) have different rules and accessing mechanisms.

Green Climate Fund (GCF) The Green Climate Fund (GCF) is a new global fund, within the UNFCCC mechanisms, created to support the efforts of developing countries to respond to the challenge of climate change with both mitigation and adaptation actions. As the C3HNAP is linked to the NAP, climate actions identified in the C3HNAP contributes to the implementation of the NAP. This is key for accessing GCF resources, which requires high quality proposals aspiring to promote paradigm shifts. The GCF is aiming for 50% of the funds to go to Least Developed Countries (LDCs), Small Island Developing States (SIDS), and African States.

The Adaptation Fund (AF) was established by the Parties to the Kyoto Protocol of the UN Framework Convention on Climate Change to finance concrete adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol. It provides resources for adaptation projects and program in developing countries including LDCs.

The Global Environment Facility (GEF) is an international partnership of 183 countries, international institutions, civil society organizations and the private sector that addresses global environmental issue and funds are available to developing countries and countries with economies in transition to meet the objectives of the international environmental conventions and agreements. Two funds under GEF are the Least Developed Country Fund (LDCF) and the Special Climate Change Fund (SCCF).

The Least Developed Country Fund (LDCF) was established under GEF to assist least developed countries to take quick actions including implementing projects identified under NAPA. The Tanzania NAPA identified the health sector to be among of priority sectors that have been affected by climate change and need urgent adaptation initiatives.

Special Climate Change Fund (SCCF), a GEF initiative, supports adaptation and technology transfer in all developing country parties to the UNFCCC. The SCCF supports both long-term and short-term adaptation activities in water resources management; land management; agriculture; health; infrastructure development; fragile ecosystems including mountainous ecosystems; and integrated coastal zone management.

Finally, the **World Bank**, and **other development banks**, have climate funding streams which can be accessed for C3HNAP implementation and adaptation actions.

6 Monitoring and Evaluation

6.1 Purpose of M&E

A key component to the successful implementation of the C3HNAP is a detailed and functional monitoring and evaluation (M&E) plan. The M&E framework should be flexible and practical, and aim to promote an iterative process, engage a broad range of stakeholders, and align with existing M&E mechanisms, as well as global and regional reporting commitments. Further, it is recommended that indicators be both process and outcome based. Objectives of the M&E plan include:

- to track the progress of implementation of the C3HNAP action plan on the level of input and output;
- to evaluate the effectiveness and appropriateness of the adaptation actions to the strategic objectives and the overall objectives of the C3HNAP, including the allocated resources;
- to provide information to the beneficiaries, implementing agencies and financiers on the progress of C3HNAP actions.

6.2 M&E Framework

6.2.1 C3HNAP review process

The C3HNAP will be reviewed once a year by a steering committee and chaired by the MOH&FW. The Climate Change and Health Promotion Unit will coordinate the review process to ensure all relevant stakeholders are engaged. DPs will also be members of the review committee to provide technical support and guidance.

6.2.2 C3HNAP reporting

The C3HNAP reporting mechanisms will focus on quarterly and annual reports to monitor the progress of implementation of the Action Plan (2023-2030) based on the indicators described in the M&E Plan.

6.2.3 M&E Plan (2023-2030)

Based on the Action Plan and identified deliverables, the M&E plan outlines indicators, including baseline, means of verification, frequency of reporting, and responsible institutions.

Deliverable	Indicator	Baseline	Means of Verification	Frequency of reporting	Responsible institutions
Long-term C3HNAP strategic objective					
To build resilience to climate change impacts on health by empowering communities and individuals through an adaptive and sustainable health system in Bangladesh					
Component 1: Climate Transformative Leadership and Governance					
Goal: Strengthen health sector leadership, governance and coordination roles					
Collaboration with other sectors relevant to health, environment, and climate change			Meeting minutes		Lead: MoH&FW; Others: MoEFCC, MoDMR, MoSW other relevant
Integration of climate change into relevant departments and agencies to contribute into the integration of health in Nationally Determined Contribution (NDC) and Long Term Low Emission Development Strategy (LT-LEDS)	CC&H TWG established with approved TORs	CC&H TWG within CCHP Unit, but capacity remains low	Meeting minutes written TORS	Quarterly	Lead: MoH&FW Others: DPHE, WASAs, DGHS, Municipalities, DDM, CCHPU
Establishment of Climate Change and Health Promotion Unit as National Coordination Agency for Climate Change and Health Protection with specific budgets	GO for establishment as national agency for climate change and public health	CCHPU is not under revenue sector	Government Circular and Meeting Minutes	Quarterly	Lead: MoH&FW Other: CCHP Unit, key stakeholders
Component 2: Climate Smart Health workforce					
Goal: Strengthening of technical and professional capacity of health professionals at different tiers of health system on climate change and health					
Policy and decision-makers with better awareness and understanding of CC&H issues	Percentage of MoH&FW and other relevant decision-	CC&H awareness meetings not held for MoH&FW and other	Meeting reports	Annually	Lead: CCHP Unit, Other: IEDCR, ICDDR-B

Deliverable	Indicator	Baseline	Means of Verification	Frequency of reporting	Responsible institutions
to make climate smart decisions for organizational development	makers attending CC&H awareness meetings	relevant decision-makers			
Health professionals with better awareness and understanding of CC&H issues	Percentage of health workforce trained on CC&H in key programmes during in-service training	No CC&H training conducted	CC&H awareness survey	Quarterly	Lead: CCHPU Other: MoH&FW, DGHS CDC, IEDCR, NCDC, PHC), , ICDDR-B
Communities with better awareness and understanding of CC&H issues	Percentage of school organize class/programmes on CC&H risks for students; Number of mass media campaigns on climate-related health risks	Only a few schools in coastal areas organize CC&H programmes	MoH&FW/Ministry of education reports	Quarterly	Lead: Bureau of Health Education (BHU) Other: MoH&FW, DGHS (CDC, IEDCR, NCDC, PHC), City Corporation, DGHS (BHE), IPH, IEDCR, NIPSOM
Component 3: Assessment of Climate and Health Risks					
Goal: Assessment of potential health impacts of climate change and identifying adaptation options					
Identification of health risks due to impact of climate change with the goal of developing climate smart interventions	CC&H V&A conducted and submitted to MoH&FW	V&A assessments conducted in 2011,2015 and 2021 though not comprehensive	MoH&FW reports	Annually	Lead: CCHP Unit Other: IEDCR
Integration of adaptation strategies into national climate policy and position papers for climate negotiations	Percentage of MoH&FW and other relevant decision-makers attending climate change policy	No specific health adaptation strategies integration into climate policy	Government Circular, Reports, Policy Briefs	Annually	Lead: MoH&FW Other: CCHP Unit, key stakeholders
Component 4: Integrated risk monitoring and early warning					
Goal: Strengthening integrated disease surveillance and early warning system					
Integration of early warning system mechanism with disease surveillance	Monitoring system for prioritized CSD incorporate climate/weather data	Monitoring systems for CSD do not incorporate climate/weather data	MoH&FW assessment report	Annually	Lead: IEDCR Other: DGHS, CCHP Unit, BMD, DGHS (CDC), DPHE, , ICDDR-B
Climate-informed health early warning system for policy makers developed for climate-sensitive diseases	Climate-informed health early warning system	No climate-informed health early warning system exists	MoH&FW assessment report	Annually	Lead: IEDCR Other: , BMD, DGHS (CDC), DPHE, ICDDR-B

Deliverable	Indicator	Baseline	Means of Verification	Frequency of reporting	Responsible institutions
Effectively communicating health risks to the media and public with translating to action to prevent negative health impacts	Risk communication strategy for VBD, WBD, and nutrition/food security developed and approved by MoH&FW	No risk communication strategy exists	MoH&FW assessment report	Annually	Lead: IEDCR Other: DGHS (CDC, , NCDC, PHC), MoE, NNS, IPHN, BNNC, NIPSOM, ICMH City Corporation, ICDDR-B
Component 5: Health and climate research					
Goal: Conducting comprehensive research on climate change and health to facilitate the developments of targeted strategies					
Enhanced climate change and health research prioritizing on innovation for the establishment of climate resilient health system	National CC&H research agenda that includes climate-related sectors and resource mobilization developed	No CC&H research agenda exists	Resource mobilization plan, TWG meeting minutes	Quarterly	<i>Lead:</i> CCHPU <i>Other:</i> DGHS, CCHPU, ICDDR-B, NIPSOM, NIPORT
Innovation to implement low carbon health facilities to ensure sustainability and environmental health	Innovative solutions to improve carbon footprint of the health system	No MOU exists	Resource mobilization plan	Quarterly	<i>Lead:</i> CCHPU; <i>Other:</i> DGHS, DOE, IDCOL, Carbon Trading Organizations
Enhancement of research capacity with focus to transform research into policy implementation	Establishment of national agenda for research for CC&H	No such research body exist	Reports of research body	Annually	<i>Lead:</i> CCHPU; <i>Other:</i> DGHS CDC, IEDCR, NCDC, PHC), City Corporation, NGO Forum for Public Health
Component 6: Climate resilient and low carbon infrastructures, technologies and supply chain					
Goal: Implementation of Integrated Smart Logistic Management for Climate Resilience and Low carbon emission					
Vulnerability of healthcare facilities identified and addressed	"Green hospital" to be initiative piloted in 3 hospitals	3 climate resilient green hospital piloted	Green hospital assessment	Quarterly	<i>Lead:</i> Director Hospital, DGHS <i>Other:</i> MoH&FW; Health Engineering Dept.
Climate resilient logistic management system implementation in the climate vulnerable areas	Guidelines and SOPs for health protection from adverse health effects and pre-and-post disaster situations developed and approved	Guidelines and SOPs do not exist	MoH&FW assessment reports	Quarterly	<i>Lead:</i> CCHPU <i>Other:</i> MoH&FW Disaster Management Bureau; Water Resources; BMD; DPHE;
Develop logistical adequacy to tackle short term as well as long term impacts of climate	All health care facilities have adequate supplies to manage CSD	All health care facilities (down to upazila health	Smart hospital assessment	Quarterly	<i>Lead:</i> Director Hospital, DGHS <i>Other:</i> MoH&FW, CCHPU, Disaster Management Bureau; Water

Deliverable	Indicator	Baseline	Means of Verification	Frequency of reporting	Responsible institutions
change on health and well-being		complex) have adequate supplies			Resources; BMD; ICDDR-B, National Public Health Laboratory
Component 7: Management of environmental determinants of health					
Goal: Establishment of multisectoral risk management framework to address health risks					
Water safety plan strengthened and safe water and sanitation for healthcare facilities ensured	Climate-resilient water safety plan implemented in X number of facilities	No climate resilient WSP developed and implanted yet for any health care facilities	WSP assessment	Quarterly	<i>Lead:</i> DPHE <i>Other:</i> LGD, WASAs, DoE, Municipalities,
Integrated air quality monitoring developed to reduce the disease burden of Non-communicable diseases	Strategy to pilot climate-proofing health facilities developed Air quality is tested routinely and linked with disease surveillance	No strategy developed Air quality not tested routinely and linked with disease surveillance	Different Air quality assessment reports and assessment Environmental health risk assessment	Quarterly	<i>Lead:</i> DOE <i>Other:</i> MoH&FW, CCHPU Unit, NCDC, IEDCR
Build a coordinated cross-sectoral management for policy development and implementation to ensure sustainable environment for health and wellbeing	Policy document addressing cross-sectional management	No such document is present	G.O for documentation to provide policy documents	Annually	<i>Lead:</i> MoHFW <i>Others:</i> MoSW, MoDMR, MoE, MoEFCC
Component 8: Climate-informed health programmes					
Goal: Strategic Planning of health programmes for climate sensitive diseases					
Climate risks included in planning and implementation of climate-sensitive diseases (VBD, WBD, nutrition/food security)	VBD, WBD, and nutrition/food security policies and operational plans include climate risks	VBD, WBD, and nutrition/food security policies and operational plans do not include climate risks	MoH&FW assessment report	Annually	<i>Lead:</i> MoH&FW <i>Other:</i> MoH&FW, DGHS, CCHP Unit, identified programmes
Health programme focused Intervention delivery mechanism to be developed	Risk maps develop for VBD, WBD, and nutrition/food security	Mapping is inconsistent and not targeted for decision-makers	MoH&FW/DGHS assessment report	Bi monthly	<i>Lead:</i> CCHPU <i>Other:</i> MoH&FW CCHP Unit; IEDCR, NNS, IPHN, BNNC, NIPSOM, ICMH, ICDDR-B

Deliverable	Indicator	Baseline	Means of Verification	Frequency of reporting	Responsible institutions
	Implement health adaptation intervention in high-risk areas	Health adaptation interventions not targeted in high-risk areas	MoH&FW assessment	Annually	<i>Lead:</i> CCHPU MoH&FW, DGHS, CCHP Unit, identified programmes
Component 9: Emergency preparedness and management					
Goal: Emergency Preparedness and Management					
Climate change and health risks included in disaster risk management plans	Climate-sensitive health risks and climate data integrated into national disaster risk reduction strategy	Climate-sensitive health risks and climate data not integrated into national disaster risk reduction strategy	Disaster management reports	Annually	<i>Lead:</i> MIS <i>Other:</i> MoH DGHS, Disaster Management, Hydro-Met Services. DOE, BMD, DPHE
	Health facilities emergency preparedness plans are developed that incorporate CC&H risks	Generic hospital emergency preparedness plans are developed	MoH&FW assessment reports	Bi-monthly	<i>Lead:</i> CDC, NCDC <i>Other:</i> MoH&FW, DGHS, Disaster Management, DOE, DPHE, Bangladesh Meteorological Department
	All health facilities are fully supplied to manage emergencies	Data needed	MoH&FW assessment reports	Bi-monthly	<i>Lead:</i> CDC, NCDC <i>Other:</i> MoH&FW, DGHS, Disaster Management, Hydro-Met Services
Component 10: Sustainable Climate and health financing					
Goal: Ensure Adequate resources to address the health impacts of climate variability and climate change as a line item in national health investment					
Fund mobilized for adaptation and mitigation measures	Resource mobilization plan that identifies funding mechanisms for health developed	No resource mobilization plan for CC&H exists	MoH&FW assessment reports	Annual	<i>Lead:</i> MoH&FW <i>Other:</i> DGHS, CCHP Unit
	Cost-benefit analysis for adaptation to climate change in the health sector completed	Cost-effectiveness analysis completed 2014 (World Bank)	Report on cost-benefit analysis	Annual	<i>Lead:</i> MoH&FW <i>Other:</i> DGHS, CCHP Unit
	X number of proposal submitted and approved for CC&H related funding	GEF proposal submitted and approved (2018)	Funding reports	Bi-monthly	<i>Lead:</i> MoH&FW <i>Other:</i> DGHS, CCHPU IEDCR, CDC, NCDC, Met-Services

7 References

1. Alam D, Robinson H, Kanungo A, Hossain MD, Hassan M. (2013). Health Systems Preparedness for responding to the growing burden of non-communicable disease-a case study of Bangladesh. Nossal Institute for Global Health. 1–25.
2. Berry, H.L., K. Bowen, T. Kjellstrom (2010). Climate change and mental health: a causal pathways framework. *Int J Public Health* 55: 123. <https://doi.org/10.1007/s00038-009-0112-0>
3. CCHP (2012). Climate change and health: Bangladesh Adaptation Strategy Report. Ministry of Health and Family Welfare, Climate Change and Health Promotion Unit.
4. CCHP (2014). Climate change and health impacts: How vulnerable is Bangladesh and what needs to be done? Ministry of Health and Family Welfare, Climate Change and Health Promotion Unit, International Centre for Diarrhoeal Disease Research, Bangladesh, World Bank.
5. Friel, S., K. Bowen, D. Campbell-Lendrum, H. Frumkin, A.J., McMichael, K. Rasanathan. (2011). Climate change, noncommunicable diseases, and development: The relationships and common policy opportunities. *Annu. Rev. Public Health* 2011. 32:133–47
6. GoB (2015). Seventh Five-Year Plan (2016-2020). General Economics Division (GED), Bangladesh Planning Commission, Government of the People's Republic of Bangladesh. Sher-e-Bangla Nagar, Dhaka, Bangladesh
7. Huq S, Asaduzzaman M. Overview. In: Huq S, Karim Z, Asaduzzaman M, Mahtab F, (1999) Vulnerability and adaptation to climate change for Bangladesh. Dordrecht: Kluwer Academic Publishers; 1–11.
8. IEDCR (2011). Climate Change and Health Vulnerability and Adaptation Assessment Report. Institute of Epidemiology, Disease Control and Research and World Health Organization Country Office for Bangladesh, Dhaka
9. Khan, Aneire E., Wei W. Xun, Habibul Ahsan and Paolo Vineis, (2011) Climate Change, Sea-Level Rise, & Health Impacts in Bangladesh, Environmental Science and Policy for Sustainable Development
10. Kovats RS, Bouma MJ, Hajat S, Worrall E, Haines A. (2003). El Niño and health. *Lancet*; 362:1481–9
11. M Alimullah Miyan, (2014) Droughts in Asian Least Developed Countries: Vulnerability and sustainability. Article: Weather and Climate Extremes 7(C)
12. Mainul Huq, Malik Fida Khan, Kiran Pandey, Manjur Murshed Zahid Ahmed, Zahirul Huq Khan, Susmita Dasgupta and Nandan Mukherjee, (2010) Vulnerability of Bangladesh to Cyclones in a Changing Climate. World Bank Development Research Group
13. MoEF (2005). Bangladesh National Adaptation Programme of Action (NAPA). Ministry of Environment and Forests, Government of the People's Republic of Bangladesh
14. MoEF (2009). Bangladesh Climate Change Strategy and Action Plan. Ministry of Environment and Forests, Government of the People's Republic of Bangladesh

15. MoEF (2014). A Roadmap for Developing a National Adaptation Plan for Bangladesh. Ministry of Environment and Forests, Government of the People's Republic of Bangladesh
16. MoEF (2015). Intended Nationally Determined Contributions (INDC). Ministry of Environment and Forests, Government of the People's Republic of Bangladesh
17. MoH&FWFW (2011). Strategic Plan for Health, Population and Nutrition Sector Development Program. Ministry of Health and Family Welfare.
18. MoH&FWFW (2015). Health Bulletin 2015, Directorate General of Health Services Ministry of Health and Family Welfare, Government of Bangladesh 2015.
19. Rahman, A., O. Alonge, A., Bhuiyan, P., Agrawal, S.S., Salam, A., Talab, Q., Sadeq-ur Rahman and A.A., Hyder (2017). Epidemiology of Drowning in Bangladesh: An Update. *Int. J. Environ. Res. Public Health* 2017, 14, 488; doi:10.3390/ijerph14050488
20. Shahid, S. (2010). Probable Impacts of Climate Change on Public Health in Bangladesh. [Asia Pac J Public Health](#). Jul;22(3):310-9. doi: 10.1177/1010539509335499.
21. Tanner et al. (2007). Piloting Climate Risk Screening in DFID Bangladesh IDS Detailed Research Report. ORCHID
22. Tjaden, N., J., Suk, D., Fischer, S., Thomas, C., Beierkuhnlein, J. Semenza. (2017). Modelling the effects of global climate change on Chikungunya transmission in the 21st century. *Scientific Reports* volume 7, Article number: 3813
23. Kabir, I., M., Dhimal, R., Müller, S., Banik, U., Haque (2017). The 2017 Dhaka Chikungunya outbreak. *The Lancet Infectious Diseases*, Vol. 17, No. 11 pp. 1118 DOI: [https://doi.org/10.1016/S1473-3099\(17\)30564-9](https://doi.org/10.1016/S1473-3099(17)30564-9)
24. WHO (2014). WHO guidance to protect health from climate change through health adaptation planning. World Health Organization
25. WHO (2015a) Climate and Health Country Profile – 2015: Bangladesh. World Health Organization
26. WHO (2015b). Operational framework for building climate resilient health systems. World Health Organization. ISBN 978 92 4 156507 3
27. WHO (2015c). Vulnerability and adaptation to climate change in coastal and drought prone areas of Bangladesh: WASH and health. World Health Organization, Environment Health Unit, Bangladesh
28. WHO (2015d). Review of climate change and health activities: Bangladesh. World Health Organization SEARO
29. WHO (2017). Framework for action in building health systems resilience to climate change in South-East Asia Region 2017-2022. World Health Organization. ISBN: 978-92-9022-610-9

Annex 1: Proposed climate change and health stakeholders

MoH&FW: Ministry of Health and Family Welfare
DGHS : Directorate General of Health Services
DGME: Directorate General for Medical Education
DGFP: Directorate General for Family Planning
DGNM: Directorate General for Nursing and Midwife
DGDA: Directorate General for Drug Administration
HED: Health Engineering Department
EDCL: Essential Drug Company Limited
TEMO: Transport and Equipment Maintenance Organization
NEMEW&TC: National Electro-Medical Equipment Workshop & Training Centre
DPHE: Department of Public Health Engineering,
DDM: Department of Disaster Management
IEDCR: Institute of Epidemiology Disease Control and Research
Icddr,b: International Centre for Diarrheal Disease Research, Bangladesh
CDC: Communicable Disease Control Program
NCDC: Non-Communicable Disease Control Program,
PHC: Primary Health Care Program
BHE: Bureau of Health Education
IPH: Institute for Public Health
IPHN: Institute for Public Health Nutrition
BNNC: Bangladesh National Nutritional Council
NIPSOM: National Institute for Preventive and Social Medicine
BMD: Bangladesh Meteorological Department
ICMH: Institute for Child and Mother Health
NIPORT: National Institute of Population Research and Training
BBS: Bangladesh Bureau of Statistics
DoE: Department of Environment
DoF: Department of Forest
DSCR: Department of Disaster Science and Climate Resilience
Private Sector
INGO/NGO/CSO
Youth Forum
BACHA: Bangladesh Alliance for Climate and Health Adaptation
Development Partners

Annex 2: Review of Global NAP

1. National Adaptation Plan of Armenia

On 10 September 2015, The Government of the Republic of Armenia identified seven sectors with particular adaptation needs: (a) natural ecosystems (aquatic and terrestrial, including forest ecosystems, biodiversity and land cover), **(b) human health**, (c) water resources management, (d) agriculture, including fisheries and forests, (e) energy, (f) human settlements and infrastructure, and (g) tourism. The vision of the NAP is to consider the vulnerable impacts of climate change, particularly to the following sectors, incorporating climate change adaptation consideration.

The NAP of Armenia 2021-2025 consists of two sets of implementable measures. Among these, health is a priority in the second set of adaptation measures.

Armenia NAP Summary (2021-2025)				
Sector	Adaptation Measures	Indicative Outcome	Performer	Co-Performer
Waterborne disease				
Vector-borne disease				
Non-Communicable Disease				
Mental Health	Development of the draft Republic of Armenia Government Decree “On approval of the climate change adaptation plan for the healthcare sector” and submission to the office of the Republic of Armenia Prime Minister	CCA considerations are integrated into the strategic development process of the healthcare sector	Ministry of Healthcare of the Republic of Armenia	Ministry of Environment of the Republic of Armenia
Sexual and Reproductive Health and Rights				
Nutrition and Food Security				

2. National Adaptation Plan of Brazil

To increase the climate resilience, the NAP of Brazil identified 11 thematic sectors, namely Agriculture, Biodiversity and Ecosystems, Cities, Disasters, Industry and Mining, Infrastructure (Electric Power, Transport and Urban Mobility), Vulnerable Populations, Water Resources, Health, Food and Nutritional Security, and Coastal Zones.

Brazil NAP Summary						
Sector	Thematic Strategy	Objective	Goal	Initiatives	Indicating/ Monitoring	Impact
Waterborne disease						
Vector-borne disease						
Non-Communicable Disease						
Mental Health	Health	Identify and propose measures to promote adaptation to and reduction of climate risk.	3.11. Expand the scope of the National Drinking Water Quality Surveillance Program to reach 85% of Brazilian municipalities, by 2019.	Enhance the National Drinking Water Quality Surveillance Information System (SISAGUA) incorporating new features and health-risk management reports; Expand and establish the network of laboratories for monitoring, follow-up and dissemination of information on the quality of drinking water; Record on SISAGUA information on registration, control and surveillance of drinking-water quality; Draw up risk maps on the supply of drinking water, based on the	Percentage of municipalities with information on registration, control and surveillance of drinking-water quality recorded on SISAGUA.	Strengthened surveillance of drinking-water quality Enhanced information on water supply for human consumption Reduction of risks to human health related to drink-water supply Support for attainment of sustainable development goals relating to access to water of quality compatible with current standards.
Sexual and Reproductive and Rights	Health					

Brazil NAP Summary						
Sector	Thematic Strategy	Objective	Goal	Initiatives	Indicating/ Monitoring	Impact
				information generated by SISAGUA.		
	Health	Identify and propose measures to promote adaptation to and reduction of climate risk.	3.12 Establish a study, research, monitoring and communication network on climate and health, with a view to expanding technical-scientific knowledge and inputs for health status analysis and for consolidated decision-making of the Unified Health System (SUS)	Integrate climatic, environmental and socioeconomic risk analysis into SUS procedures for monitoring of public health emergencies; Establish centres for studies and research on climate and health within the SUS; Establish a panel for strategic information on climate and health to support the strategic management in the SUS; Establish a Centre for Integration of Health, Environment and Sustainability Technologies (CITSAS) within the National Climate and Health Observatory and the Knowledge Centre on Public Health and Disasters (CEPEDES).	Network established and consolidated; Cooperation agreement drafted and implemented; Network project drafted; CITISAS project drafted; Protocol for monitoring public health emergencies integrated with analysis of climatic, environmental and socioeconomic risk drafted; Panel for strategic information on climate and health established; Integration Centre for Health, Environment and Sustainability Technologies established.	Enhanced quality of information, management capacity, and disclosure of information on climate risk to human health; Stimulus for producing scientific and technical knowledge on the relationship between climate and health and climate-sensitive diseases, in support of decision-making and definition of adaptive measures, within the SUS.
Nutrition and Food Security						

SUS Guidelines and Strategies for Health		
Axis	Guideline	Strategies
“Information Management” Deals with expansion of scientific and technical knowledge; production and availability of official data and information for research on the relationship between health and climate; the burden of disease attributable to climate change; the economic costs and benefits of adapting to climate change; and mitigation measures to reduce the impact of climate risks on health in Brazil.	GUIDELINE 1. Improvement of the quality of information and processes for risk reporting to assist with SUS activities in public-health emergencies associated with climate change.	Cross-reference reports of injuries and disease with hospital-admissions records relating to disasters, localities with high concentrations of air pollution and poor access to drinking water.
		Improve reporting of deaths classified as stemming from disaster events, air pollution, cold and heat waves.
		Set up, within the SUS, a system for reporting and warning of disasters, integrated with Civil Defence.
		Develop and deploy Risk Notification Management, involving all sectors and management levels of the SUS.
		Expand and encourage use of geographic and modelling information systems for understanding the dynamics and prevention of diseases;
		Establish indicators and monitoring systems to enable monitoring of impacts of climate change on health and the expected outcomes of this Plan.
	GUIDELINE 2. Promotion of studies & research on the effects of climate change on human health, considering traditional knowledge, regional characteristics and ecosystems when constructing knowledge.	Perform studies that establish costs/benefits of adaptation and mitigation actions for the health sector;
		Encourage and identify national climate and health research leaders;
		Encourage creation of climate and health research centres within research institutions and universities;
		Promote research on the burden of climate-sensitive diseases in Brazil to assess the influence of climate and of social, economic and environmental vulnerabilities in their occurrence;
		Promote studies and research to identify human health risk areas and vulnerable populations, in the context of the impacts of climate change in Brazil;
		Create stable funding sources for public investment and incentives for health-related science, technology and innovation (CT - Saúde).
“Awareness and Education”	GUIDELINE 3.	Include climate-change and human health themes in specialisation courses, capacity-building and training programmes targeted at SUS professionals, within the context of the programme.

SUS Guidelines and Strategies for Health		
Axis	Guideline	Strategies
Entails promoting awareness of the risks of climate change to human health, by means of campaigns, events, courses, capacity building, training, publications, policy guidance, etc. on the theme, to encourage changes of behaviour and enlist support of the public and authorities for development of strategies to reduce vulnerabilities and protect health, making the population more resilient to climate change.	Promotion of capacity-building and actions to raise awareness of the population and of SUS professionals on the effects of climate change on human health and the importance of sustainable development, and encouragement of community participation in definition of mitigation and adaptation policies.	Develop a capacity-building programme for SUS professionals on the impacts of climate change and its effects on health, within a sustainable-development approach;
		Provide inputs for actions within the framework of the Healthy Cities programme;
		Promote education and awareness on climate-change and its effects on human health within measures and actions targeted at SUS professionals and organised civil-society partner institutions to promote changes in risk perception;
		Develop specific training programmes to guide actions of SUS professionals in disaster situations;
		Strengthen community involvement in the definition of priority public-health policies, in compliance with Law 8142/90.
Strengthen inter-institutional, and intra and inter-sectoral coordination spaces for continuous improvement of technical and management instruments and the effectiveness of crosscutting actions relating to the impacts of climate change and their effects on health	GUIDELINE 4. Strengthening of the inter-sectoral and inter-institutional coordination, targeted at definition of crosscutting actions, including provision of data and information for knowledge production, technology transfers and actions to promote adaptation and mitigation in the health sector.	Establish mutually-agreed instruments to promote access to environmental and socioeconomic data and information
		Establish methodologies and techniques for health-status analysis of the population in relation to risks associated with current climate factors and prepare future projections and scenarios
		Promote technology transfers and exchanges of practices within the health sector to enable adoption of effective adaptation and mitigation measures in the health sector
"Adaptation"	GUIDELINE 5.	Implement and expand clean renewable energy generation and increase energy efficiency within SUS and Supplementary Health facilities;

SUS Guidelines and Strategies for Health		
Axis	Guideline	Strategies
Covers adaptation measures required to strengthen prevention, preparation and response capacity of the health sector, to minimise vulnerabilities of the population in face of the impacts of climate change, thereby contributing toward resilience of the health system and of the population to minimize the vulnerabilities of the population to the impacts of climate change and contribute toward the resilience of the health system and of the population.	Fostering of sustainable, resilient and secure infrastructure for public healthcare and Supplementary Health facilities, to ensure continuity of health services in disasters relating to water and energy-insecurity scenarios; promote sustainable development among the many segments of the health sector; and contribute to reducing GHG emissions.	Reduce water consumption and ensure continuity of drinking water supply in health facilities;
		Replace hazardous chemical substances used in health facilities for less polluting and safer alternatives;
		Reduce, treat and ensure secure disposal of waste from health services;
		Reduce use of oil-based substances and other pollutants in the manufacture of cosmetics, health products, household cleaning and medical-drugs;
		Reduce inadequate disposal of pharmaceutical products and consequent pollution;
		Adopt principles of the Programme for Sustainable Public Hiring during procurement of products, materials, furniture goods, and real estate and promote sustainable innovations within the SUS and Supplementary Health framework;
		Improve strategies for transport of patients and staff to reduce GHG emissions;
		Purchase and supply healthy and sustainably cultivated foods for the healthcare network;
		Build a GHG inventory for the health area (motor vehicles, industrial complex, disposal and treatment of health-services waste);
		Issue a technical regulation to address the planning, programming, preparation and evaluation of physical projects for healthcare facilities, covering: 1) recommendations and concepts of the Pan American Health Organisation for construction of hospitals and disaster-proof health units, with a view to ensuring their operation during and in the aftermath of public health emergencies, and 2) use renewable energy sources and reduce water consumption.
	GUIDELINE 6.	Establish information mechanisms targeted at vulnerable populations, to encourage adoption of low environmental impact practices and their benefits for human health, in partnership with environmental, agricultural and agrarian development bodies, among others
	Formulation of specific policies to increase resilience of social groups with greater	
		Establish a methodology for production of information by communities that are vulnerable to the impacts of climate change on human health

SUS Guidelines and Strategies for Health		
Axis	Guideline	Strategies
	vulnerability to climate change in rural areas, wetlands, and among forest populations, indigenous peoples and the homeless.	Adopt sustainable technologies to enable deployment of health services in indigenous, quilombola and remote areas, e.g., renewable modern solar energy sources and alternative technologies for treatment of health-services wastes;
		Perform health surveillance actions to build knowledge on epidemiological profiles of rural, wetland and forest, indigenous, quilombola and homeless populations for adoption of measures for adaptation to climate change.
	GUIDELINE 7. Strengthen implementation of the national policy for sanitation and health, with the aim of universalization of access to drinking water and sanitation services.	Expand and strengthen the Network of Laboratories for the monitoring, follow-up and dissemination of information on the quality of soil and of water for human consumption;
		Improve diagnoses, evaluation and risk-management instruments for assessment of availability, access to and quality of drinking water, considering urban and rural vulnerability scenarios and the specific vulnerabilities of states and regions, within a climate-change context
		Stimulate adoption of new water-treatment technologies to serve demand related to public health emergencies, arising from effects of climate change.
	GUIDELINE 8 Strengthen health surveillance to identify human health risks associated with climate change to support the adoption of adaptation measures within the SUS context.	Include climate-change and human-health themes on the agenda of inter-disciplinary and inter-sectoral regional Standing Committees for Health Surveillance, with public participation (Decree 7508/2011) in support of prevention, preparation and response actions of healthcare networks;
		Encourage preparation and implementation of Public Health Emergency Plans within state and municipal-level SUS facilities, with the participation of all SUS sectors and of partner institutions;
		Expand the Network of Reference Laboratories for monitoring and follow up of vectors and of clinical analyses of infectious and non-communicable diseases;
		Establish mechanisms and tools for identification of populations dependent upon health facilities in-disaster risk areas, in partnership with Civil Defence and other agencies that produce data;
		Identify etiological causes in health-emergency associated cases

SUS Guidelines and Strategies for Health		
Axis	Guideline	Strategies
		Deploy climate and environmental-risk analysis in health surveillance activities

Exposure	Assessment of vulnerabilities and impacts of climate change, and their effects on human health				
	Vulnerabilities		Effects		
	Environmental Agent	Conditioning	Socioeconomic Conditioning Agent	Population	SUS
Disasters: Flooding and Drought	Terrain, hydrography, silting of rivers, deforestation of hillsides, irregular settlement, river-flow levels (water-use quotas), vegetation cover, land use altitude.		Housing conditions, water supply systems, solid-wastes collection, inadequate wastewater treatment and drainage, settlements in high risk areas, population density, most vulnerable populations (elderly, children, pregnant women), residents of high-risk areas favelas and hillsides).	Short term: Deaths and hospitalisations related to external causes (drowning, landslides, fractures, trauma etc.); Homeless, evicted, displaced. Medium-term: Increase in infectious diseases and epidemics. Long term: Mental and cardiovascular problems; Malnutrition and food insecurity.	Overloading of health facilities; Disruption of service networks; Impacts on infrastructure (buildings, inputs, equipment and personnel); Discontinuity of routine healthcare services.
Air Pollution	Terrain, hydrography, vegetation, deforestation, seasonality, wildland fire.		Age composition of the population (children and elderly); Combustion of fuels; Industrial activity, Forest fires; Population density, housing and schooling levels.	Increase in infant, and under-5 and elderly over 60 mortality from respiratory diseases, and of adults over 40 from cardiovascular disease (arrhythmias and heart failure); Neoplasms (lung cancers), dermatological diseases, etc.	Overloading of health facilities; Increase in Numbers of deaths, Hospitalisations and outpatient care.
Reduced capacity and quality of water resources	Rising sea levels, reduction in bulkwater supply for treatment and human water supply, and extreme		Poor or no sanitation; Reduced treated water supply for human consumption; Poor treated water supply distribution network;	Water-borne and food-related diseases (diarrhea, hepatitis A and E, typhoid, leptospirosis,	Overloading of health facilities due to increased demand, hospitalisations and deaths.

Exposure	Assessment of vulnerabilities and impacts of climate change, and their effects on human health				
	Vulnerabilities		Effects		
	Environmental Agent	Conditioning	Socioeconomic Conditioning Agent	Population	SUS
	weather events (drought or flooding)		Poor availability of alternative sources; Intermittent water supply; Total or partial interruption of water-supply services.	dengue, yellow fever, cholera, dehydration, schistosomiasis, trachoma, among others)	Collapse of routine operation of the health units
Climate-sensitive infectious diseases	Rise or fall of temperature, humidity and rainfall, greater frequency of extreme weather events (too much or not enough rain), changes in the quality of drinking water, land use and vegetation cover, deforestation, fires.		Territorial planning, housing model and changes in land use; Population movements and migrations; Proximity of households to hazardous locations and mobility of populations of high risk areas; Immunisation coverage; Occupational exposure (extractive, rural workers) or leisure (rural tourism, ecotourism); Existence and quality of basic sanitation; Quality of drinking water; Availability of household hygiene measures; Such social indicators as: schooling and income levels.	Increased numbers of cases such health hazards as: illnesses associated with thermal discomfort, dengue fever, malaria, yellow fever, leishmaniosis, schistosomiasis, trachoma, leptospirosis, viral hepatitis, acute diarrhoeal diseases, cholera, Chagas disease, severe acute respiratory syndrome (SARS), influenza syndrome (influenza	Overloading of health facilities owing to increased demand, hospitalisations and deaths. Re-emergence of controlled diseases.

3. National Adaptation Plan of Burkina Faso:

The vision of the Burkina Faso NAP reads: "Burkina Faso intends to manage its economic and social development more efficiently by implementing planning mechanisms and measures taking account of resilience and adaptation to climate change between now and 2050".

The long-term adaptation objectives based on that vision are to:

- protect accelerated growth pillars;

- ensure sustainable food and nutrition security;
- preserve water resources and improve access to sanitation;
- protect persons and goods from extreme climate events and natural disasters;
- protect and improve the functioning of natural ecosystems;
- protect and improve public health

Burkina Faso NAP Summary			
Sector	Specific Objectives of Action Plan	Short, Medium and Long-Term Adaptation Objectives	Adaptation Measures
Waterborne disease	SO 4: Improve access to sanitation	Protect and improve public health	Indicator: Rate of reduction in waterborne diseases Outcome: Populations living next to waterbodies are protected against waterborne diseases.
Vector-borne disease	Development Sector:Health SO 1: Ensure leadership and governance in terms of adapting to the impacts of climate change on the health sector SO 2: Increase human resources in the health sector skilled in adapting to the effects of climate change SO 3: Improve the early warning system and the response to climate change-related phenomena		<i>Malaria:</i> Provide proper treatment in all cases of simple malaria using ACT Provide intermittent preventive treatment of malaria using ITP for pregnant women and children and distribute long-lasting insecticidal nets (LLIN) in routine mass campaigns Decontaminate swampy sites and wastewater and excreta Combat malaria vectors (indoor spraying, behavior change communication (BCC) at mass media and community relay level, treat breeding grounds)
Non-Communicable Disease	SO 4: Adapt health infrastructure to the effects of climate change		<i>Meningitis:</i> Vaccine before first cases are reported Organise reactive campaigns that target the entire population in epidemic zones
Mental Health	SO 5: Improve research in the field of climate change		
Sexual and Reproductive Health and Rights			

Burkina Faso NAP Summary			
Sector	Specific Objectives of Action Plan	Short, Medium and Long-Term Adaptation Objectives	Adaptation Measures
			Increase meningitis monitoring using the geographical information system Step up public awareness-raising and information campaigns
Nutrition and Food Security	Development Sector: Animal Production SO 2: Ensure the security of animal capital with a view to supporting the pastoral economy on a sustainable basis and improve the resilience of stakeholders in order to achieve sustainable food security in Burkina Faso	Ensure sustainable food and nutrition security	Increase the resilience of vulnerable communities and households to food and nutrition insecurity by improving their livelihood Achieve a structural and sustainable reduction in food and nutrition vulnerability of vulnerable communities and households Improve social protection of vulnerable communities and households to secure their livelihood Capitalise on and share innovations and best practices to support food and nutrition security Make increased use of non-timber forest products as food supplements Develop sustainable milk production to increase public food security

Climate change adaptation potential

Strategic headings under the National Sanitary Development Plan	Intervention targets under the National Sanitary Development Plan	Priority actions under the National Sanitary Development Plan	Climate impact or risk (related to climate change)	Adaptation integration potential
Develop leadership and governance in the healthcare sector	Improve the internal coordination of the Ministry of Health interventions	Improve policy-making within the Ministry of Health with a focus on gender and equity	Current policies and policy-making structures may be disrupted by the consequences of climate change (greater incidence of certain diseases, such as diarrhea, malaria,	Integrate climate change issues into policies, strategies and policy-making structures

			meningitis, measles, malnutrition etc.).	
	Strengthen intersectoral collaboration and partnerships in the healthcare sector	Establish/strengthen appropriate frameworks for collaboration and sanitation development planning between the Ministry of Health and other stakeholders at all levels	The consequences of climate change may mean that the current collaboration structures are no longer fit for purpose	Ensure that account is taken of climate change issues during intersectoral collaboration in the field of risk management
Strengthen human resources in the healthcare sector	Ensure that high-quality human resources are available in the Healthcare sector	Draft a national CPD strategy with consolidated plans at all levels of the healthcare system	The level of knowledge among healthcare personnel may not be sufficient to deal with climate change impacts	Incorporate climate change issues into training courses for healthcare personnel
Health promotion and disease prevention	Improve communications with a view to behavioral change	Implement communication plans for the healthcare sector	Climate change impacts may make populations more vulnerable	Incorporate climate change impacts into communication strategies with a view to behavioural change
	Step-up measures to prevent Transmissible diseases	Strengthen the monitoring system at all levels	Climate change impacts (raised temperatures, floods) may increase the incidence of epidemics (measles, cholera, meningitis) and certain diseases (malaria)	Incorporate climate change impacts into prediction and response tools
Improve healthcare infrastructures, equipment and products	Build infrastructures	Establish new sanitary infrastructures at each level which comply with the relevant standards	Floods may damage certain sanitary infrastructures	Incorporate climate-change-related impacts into the design and implementation of sanitary infrastructures
Promote research in the healthcare sector	Improve the institutional and	Improve the operational capacities of the Ministry of	Modify the transmission dynamics of climate-sensitive diseases	Incorporate climate change issues into research topics in the healthcare sector

	operational capacities of the Ministry of Health in the field of research	Health in the field of research.		
Increase funding for healthcare and the public affordability of healthcare services	Mobilise healthcare funding	Advocate for an increase in the state healthcare budget	Managing climate-change-related risks and disasters may overburden healthcare budgets	Incorporate the management of climate change impacts into the state healthcare budget

Summary of Adaptation Actions:

Strategic headings	Specific objectives	Intervention targets	Adaptation actions	Anticipated impacts and outcomes	Indicators
Develop leadership and governance in the healthcare sector	Develop leadership and governance for climate change impact adaptations in the healthcare sector	Improve coordination	Incorporate climate change issues into healthcare strategies	Climate change issues have been incorporated into healthcare strategies	National Healthcare strategies incorporating climate change issues are available
			Strengthen collaboration between the climate change and healthcare sectors	Intersectoral collaboration has improved	A framework for collaboration is in operation
Strengthen human resources in the healthcare sector	Build human resource capacities in the healthcare sector	Ensure that high-quality human resources are available in the healthcare sector	Improve levels of knowledge among personnel in relation to climate-change-sensitive diseases	Training is provided on climate change	A training plan has been produced
				Healthcare personnel are more knowledgeable about climate change	Number of people trained

Strategic headings	Specific objectives	Intervention targets	Adaptation actions	Anticipated impacts and outcomes	Indicators
Health promotion and disease prevention	Improve detection and response rates for climate change-related phenomena	Improve communications aimed at behavioral change	Develop a communication strategy for climate change impact adaptations	Populations are more aware of climate change impacts	A communication strategy is available. Awareness-raising resource are available
		Step up the fight against climate-sensitive diseases	Build capacities for forecasting, and responding to climate-change-related phenomena	Capacities for forecasting and responding to climate change-related phenomena have been improved	Forecasting and response tools are available.
Improve healthcare infrastructures, equipment and products	Adapt healthcare infrastructures to climate change impacts	Build infrastructures	Establish sanitary infrastructures that are adapted to climate change impacts.	Sanitary infrastructures have been adapted to climate change impacts	Sanitary infrastructures have been constructed to take account of climate-change-related risks.
Promote research in the healthcare sector	Promote research into climate change	Promote research	Promote research in the fields of healthcare and climate change	More is known about the impacts of climate change on the healthcare sector	Number of research studies dealing with healthcare and climate change

4. National Adaptation Plan of Cabo Verde:

In the NAP of Cabo Verde, health and nutrition & food security are considered as two of the six sectors as vulnerable to climate risks.

Cabo Verde NAP Summary (2022-2030)			
Sector	Factors Affecting the Sector	Adaptation Activities	Recommendations
Waterborne disease			
Vector-borne disease			
Non-Communicable Disease			
Mental Health	Drying trend	Preparation of disaster recovery plans for sectors with critical	
Sexual and Reproductive Health and Rights	Extreme temperature Extreme rainfall		

Cabo Verde NAP Summary (2022-2030)			
Sector	Factors Affecting the Sector	Adaptation Activities	Recommendations
	Heavy storm	infrastructure, such as water, energy, health, and communication, with analysis of redundancy options	
Nutrition and Food Security	Drying trend Extreme temperature Extreme rainfall Rising sea level		Deepen the approach to gender and vulnerable groups in initiatives to combat rural poverty and food and nutrition insecurity (gender analysis, gender-sensitive and targeted strategies, gender-sensitive follow-up and assessment).

5. National Adaptation Plan of Chad

Chad NAP Summary					
Sector	Priority Sector and Main Climate-Related Hazard	Sector Development Strategies & Plans	Sectoral actions/studies related to climate change adaptation	Factors aggravating vulnerability	Impacts
Waterborne disease	Health & Nutrition Climate-Related Hazard: Drought, Increased temperature, Flood, Strong wind, Bush and Forest fire		Some projections for disease and malnutrition trends refer to climate change, but few specific studies assess the quantitative impact of climate change on the sector.	Reduced biodiversity and the degradation of productive and forest ecosystems Degradation of the quality of water resources and the fragility of aquatic ecosystems Urbanization Degradation of agroforestry systems Drought	Increased morbidity and mortality from vector- and non-vector-borne tropical diseases (e.g. malaria, cholera, bacillary dysentery and measles) and water-related diseases, which often occur after floods (e.g. diarrhoea and cholera). Increases in temperature and decreases in humidity resulting from climate change could lead to a significant increase in the number of meningitis cases and advance its seasonal onset.
Vector-borne disease		National Strategy and Action Plan on Biodiversity			
Non-Communicable Disease					
Mental Health		-National Nutrition and Food Policy (2014–2025)			

Chad NAP Summary					
Sector	Priority Sector and Main Climate-Related Hazard	Sector Development Strategies & Plans	Sectoral actions/studies related to climate change adaptation	Factors aggravating vulnerability	Impacts
Sexual and Reproductive Health and Rights		-Intersectoral Nutrition and Food Action Plan (2017–2021) - National Food, Nutrition and School Health Policy (2014–2025) -Country Resilience Plan: Global Alliance for Resilience			Climate change is also likely to aggravate difficulties in accessing basic health services, high mortality rates (i.e. infant, child, maternal and senile mortality) and low life expectancy at birth. Chad is one of the countries where temperatures are projected to rise significantly, by as much as 5°C by 2100, leading to more frequent heat waves and thus more heat-related deaths. Projections of the share of the population affected by at least one heat wave per year show a large increase for the RCP6.0 scenario, from 2.5 percent in 2000 to 14 percent in 2080. Moreover, for the same scenario, heat-related mortality is likely to increase threefold, to 12 deaths per 100,000 inhabitants annually.
Nutrition and Food Security			Improve the food and nutritional security of rural populations sustainably, better integrate youth and women into production systems and strengthen the resilience of rural households		The significant impacts of climate change on food and water supplies will increase the risk of malnutrition and food insecurity. Chronic malnutrition in 14 regions of Chad impacts from 40.1 percent to 63.9 percent of people. The effects of climatic shocks associated with conflicts and migration exacerbate the various conditions of malnutrition.

6. National Adaptation Plan of Congo:

The objective of this National Adaptation Plan to Climate Change (NAP) of the Democratic Republic of the Congo (DRC) is to guide initiatives for the management and reduction of long-term climate risks in the country.

Congo NAP Summary (2022-2026)				
Sector	Planned Actions	Strategic Guideline	Adaptation Measures	Recommendation
Waterborne disease				
Vector-borne disease				
Non-Communicable Disease				
Mental Health	<i>Programme 2: Adaptation programme for the energy and transportation sector and improvement of the quality of life in the DRC</i> Improved access to health services by poor populations that are vulnerable to climate change	Active management of the environmental dimension of health	Public health services targeting populations at risk	Establish standard methodologies and carry out further vulnerability/risk assessments for key areas at the national level (agriculture, fisheries, livestock, water and sanitation, health, land and ecosystem degradation).
Sexual and Reproductive Health and Rights				
Nutrition and Food Security	<i>Programme 1: Adaptation programme for the agricultural sector and sustainable rural development in the DRC</i> Support programme for resilient economic growth in the agricultural sector and sustainable rural development in the DRC Promote in a sustainable manner the agricultural value chain, above all, the food crop chains Develop agribusiness to increase rural farmers' income and those of other operators in the sector Institutional and regulatory strengthening of the agricultural sector Dissemination of quality seeds and brood stock and adapted crop techniques			

Congo NAP Summary (2022-2026)				
Sector	Planned Actions	Strategic Guideline	Adaptation Measures	Recommendation
	Organization of rural communities and improvement of agricultural governance Support for the adaptation of the agricultural, agro-pastoral and agroforestry sector within the institutional and regulatory framework Support for small and medium-sized enterprises (SMEs) or other local bodies for agricultural production, processing and packaging of agricultural products Support for crops techniques and rationalization of agricultural mechanization in rural areas Programme for promoting agricultural research and building innovative capacity as part of the DRC's resilience to climate change Development and promotion of technologies likely to increase agricultural, agro-pastoral and agroforestry productivity Promotion of appropriate technologies for processing and packaging agricultural products Support to agricultural research/ action			

7. National Adaptation Plan of Ethiopia (2019)

Sector	NAP-ETH Adaptation Options	Climate risks	Potential impacts
Waterborne disease	Improving access to potable water. This adaptation option strives to attain a balance between demand and supply of potable water in the context of water conservation. Access to improved water, sanitation, and health systems will be enhanced; Improving human health systems through the implementation of changes based on an integrated health and environmental surveillance protocol. This adaptation option will embrace actions from disease surveillance to promote evidence-based policy	Increase in temperature and drought frequency, and extreme events, including heat waves, and storms.	Increase in waterborne diseases
Vector-borne disease			Increase of vector-borne diseases
Non-Communicable Disease			
Mental Health			

Sector	NAP-ETH Adaptation Options	Climate risks	Potential impacts
Sexual and Reproductive Health and Rights	decisions. Strengthening health systems will prepare them to deal with gradual changes and sudden shocks. Further emphasis will be given to climate-sensitive disease prevention and management; improving emergency medical service; balancing high population growth rate with economic growth; managing indoor air pollution; and improving basic health services, especially the health extension system.		
Nutrition and Food Security	Enhancing food security through improving agricultural productivity in a climate-smart manner. This adaptation option will focus on enhancing crop and livestock productivity by selecting resistant and tolerant varieties through switching and/or diversification, selection and breeding and by diversifying varieties. With significant numbers of people in Ethiopia living in conditions of chronic food insecurity, building resilience and adaptive capacity for vulnerable communities and groups is critical		Severe malnutrition Increase in flood incidence, displacement

8. National Adaptation Plan of Fiji (2018)

The NAP will support efforts to achieve Goal 3 which is to ensure healthy lives and promote wellbeing for all at all ages. It achieves this through the section on health which will support efforts to reduce the spread of tropical diseases and non-communicable diseases. The inclusion of health as a sector within the NAP is paramount due to Section 38 of the 2013 Constitution of the Republic of Fiji which requires the State to take 'reasonable measures within its available resources to achieve the progressive realization of the right of every person to health, and to the conditions and facilities necessary to good health, and to health care services, including reproductive health care'.

	National Adaptation Plan of Fiji (2018)
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Sector	Tackling Climate Change Impact	Priority climate-sensitive health risks	Adaptation Measure
Waterborne disease	Its population will suffer direct impacts caused by weather and climate extremes. There will be unfavorable alterations in ecological systems, altering the distribution and intensity of communicable diseases spread by vectors	Water security & safety (including water-borne diseases)	Incorporation of health agenda in national, regional, and global platforms; and ensuring effective coordination of risk management and resilience for communicable diseases, health emergencies, climate change and natural disasters and climate sensitive environmental health determinants
Vector-borne disease	The highest of concern are indirect and diffuse effects of climate-sensitive health risks, in particular the four main climate-sensitive diseases of dengue fever, typhoid fever, leptospirosis, and diarrheal disease (McIver et al., 2012). Fiji tends to experience outbreaks of these diseases when floods or cyclones have occurred (GoF, 2017).	Zoonoses Disorders of the eyes, ears, skin, and other body systems	Improve case detection and coordinated response to reduce communicable disease morbidity and mortality through strengthened partnership and cooperation
Non-Communicable Disease		Non-communicable diseases Health system deficiencies	Strengthen and empower the Climate Change and Health Unit by increasing resources and personnel with clear mandates to implement the CCHSAP 2016 – 2020 and other relevant national, regional and international plans, policies, agreements and conventions
Mental Health	Fiji experiencing negative health impacts associated with the projected climate, there will be extensive mental health impacts such as trauma and stress, including that created by the loss of traditional homes and villages.	Disorders of mental/psycho-social health	Identify and prioritize adaptation needs and associated health risk exposures of communities and populations most vulnerable to climate variability and change, including workers employed in the informal sectors Improve diagnostic and treatment capacities to manage climate change and health risks, to ensure that health care infrastructure at all levels.

Sexual and Reproductive Health and Rights			
Nutrition and Food Security	In accordance with food security being an important theme within the 2013 Constitution of the Republic of Fiji, food security is frequently mentioned by the NCCP, NDP, GGF, and FRDP. The GGF defines food security as the ‘ability to produce safe, healthy, affordable food for all Fijians at all times’. The NDP has an entire goal dedicated to ensuring all citizens have ‘access to adequate food of acceptable quality and nutritional value’ The NAP Framework does not have an explicit focus on food security but its principles of inclusiveness and managing trade-offs are vital as addressing food security and climate change requires concerted coordination by many different stakeholders, who at times have competing objectives and differing emphasis on short-and long-term outcomes.	Food security & safety (including malnutrition & food-borne diseases)	

9. National Adaptation Plan of Grenada (2017-2021)

The Ministry of Health and Social Security “Corporate Plan” for 2015-2017 was drafted in 2014, providing a road-map for MoHSS programs and activities, and outlining priority areas for health spending in that period⁵⁶. While the Corporate Plan does not explicitly mention specific climate change activities, the SWOT

analysis undertaken to develop the plan does identify climate change as a threat to national health. As part of a SMART health care facilities project, health facilities are being assessed in their infrastructure, services, disaster safety, as well as water.

	NAP Summary Grenada (2017-2021)			
Sector	Objective 1: Mobilize funds to implement NaDMA's Country Programme (2015-2019)	Objective 2: Establish climate-sensitive disease surveillance and control	Objective 3: Vector control capacities at community level	Mobilize resources for the implementation of the Greater Grenville Local Area Plan
Waterborne disease	Include climate-related actions from NaDMA's Country Programme (2015-2019) in NAP funding proposals	Include climate information and improve the national disease surveillance system to strengthen the analysis and use of disease data and enable forecasting and real-time outbreak monitoring Link historic prevalence/incidence data of priority diseases with climatic data to establish possible correlations. Limit the spread of vector-borne diseases as early as possible to protect residents and tourists	Inclusion of climate-sensitive diseases in Disaster Risk Management training Training of health care personnel on disaster preparedness, response, and vector control measures, especially at the community level	Implement or mobilize resources to implement recommendations from the WHO/PAHO "Safe Hospital Index" assessment related to disaster and climate risk reduction; set-up a "Safe & Climate-Smart Hospitals/health facilities" Programme.
Vector-borne disease				

Non-Communicable Disease			
Mental Health			
Sexual and Reproductive Health and Rights			
Nutrition and Food Security			

10. National Adaptation Plan of Japan (2018-2030)

The government of SVG has sought to deliver proper health care based on the needs of its citizens. To achieve this goal, the Ministry of Health, Wellness and the Environment (MOHWE) is pursuing preventive medicine through public education. The country is divided into nine health districts served by one general hospital, one mental hospital, five district hospitals, two nursing homes, and forty health centers (outpatient clinics). Additionally, there is one private hospital that works in tandem with the state facilities to deliver what the Pan American Health Organization (PAHO) considers adequate health coverage for the country.

	NAP Summary Japan (2018-2030)		
Sector	National Climate Change and Adaptation Initiatives:	Stakeholders' mapping and integration of CCA into policies, strategies and initiatives:	Mapping of the Links between NAP and the SDGS:

Waterborne disease	The policy of GoSVG is to provide universal health care that reflects the principles of equity, affordability, quality and cultural acceptance for its citizens.⁴⁰ Whilst there is no explicit action towards adapting the health sector to climate change, the Millennium Development Goals, the Essential Public Health Functions and the Caribbean Cooperation in Health, Phase III, and other initiatives provide a good basis for adaptation	CCCCC has already done some work in the health sector. Additionally, work has been done on the health plan for the next five years including CC considerations. The second phase of the SMART Health Care Facilities in the Eastern Caribbean Project is underway, wherein smart hospitals are being rendered resilient and energy-efficient with support from DFID. DFID is also supporting mosquito control. In 2014, after the 2013 floods, the World Bank supported an assessment of the country's healthcare facilities and identified the site for a new hospital since the previous one was located in a multi-hazard area The National Strategy Plan includes ensuring environmental sustainability within the Ministry by reducing GHG emissions and addressing water safety, vector control, and food safety (part of CC's impact on health in the CARICOM). Increased water capacity to face droughts and no-regret strategies, including source generators and solar in polyclinics, are also being considered. Some health facilities are still not covered by the Smart Hospitals Project that supports the installation of solar panels for powering cold storage facilities for vaccines and air	Ensure healthy lives and promote well-being for all at all ages End hunger, achieve food security and improved nutrition, and promote sustainable agriculture By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, and strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality
Vector-borne disease			
Non-Communicable Disease			
Mental Health			
Sexual and Reproductive Health and Rights			
Nutrition and Food Security			

		conditioning for pharmacies. There are plans to create a disaster management unit within the sector	
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11. National Adaptation Plan of Kenya (2015-2030)

Kenya's recent improvements in malarial control, water-borne diseases, infant mortality and malnutrition are vulnerable to setbacks from climate change. Impacts on water quality, water resources, changes in habitat, increasing exposure of vulnerable groups, sanitation and drainage, and vector-borne diseases are all areas for concern. These and many other potential impacts require not only continued investment and focus on climate sensitive health issues, but also full integration of climate change into Kenya's many existing health programs and policies.

NAP Summary Kenya (2015-2030)				
Sector		Action	Gaps	Ongoing projects/initiatives
Waterborne disease	During flood events there is often an upsurge in waterborne or sanitation-related diseases, such as typhoid, cholera, malaria and diarrheal diseases.	Strengthen the integration of climate change adaptation into the health sector	Capacity building, financing, technology	Piloting Climate Change Adaptation to Protect
Vector-borne disease				
Non-Communicable Disease				
Mental Health				
Sexual and Reproductive Health and Rights				

Nutrition and Food Security				
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Short Term Sub-actions	Medium Term Sub-actions	Long Term Sub-Action	Responsibility
Undertake a climate vulnerability and risk assessment of the impacts of climate change and variability on human health Increase public awareness and social mobilization on climate change and its impacts on health.	Design appropriate climate change-related interventions for the health sector. Design appropriate measures for surveillance and monitoring of climate change-related diseases in order to enhance databases on health sector indicators amongst others.	Upscale results of pilot projects in climate change adaptation in the health sector.	Ministry responsible for health, MDAs, County Governments, research institutions and academia, civil society and the private sector

12. National Adaptation Plan of Kiribati:

Kiribati Joint Implementation Plan has 12 major strategies. Two of these are:

- Increasing water and food security with integrated and sector-specific approaches and promoting healthy and resilient ecosystems.
- Strengthening health service delivery to address climate change impacts.

Kiribati NAP Summary (2019-2028)		
Sector	Sensitivity	Impacts
Waterborne disease		High rates of population growth in urban centres have placed stress on water and sanitation

		infrastructure, causing a high incidence of waterborne disease
Vector-borne disease	Increased temperatures can increase risk of water-borne (and vector-borne) diseases.	Increasing water-, food- and vector-borne diseases. Increase in vector-borne diseases, especially dengue fever. During warmer and wetter conditions, outbreaks increase (already observed during El Niño events and wet season)
Non-Communicable Disease	Changes in lifestyle, including poorer nutrition and less physical exercise, leading to a higher level of noncommunicable diseases	Increase in non-communicable diseases due to change of diet Higher dependence on food imports with low nutritional value leads to increasing noncommunicable diseases.
Mental Health	Infrastructure: Lack of financial resources needed to maintain key infrastructures such as causeways, seawalls, buildings, government houses, health clinics and schools. Infrastructure such as causeways, seawalls, buildings, government houses, health clinics and schools are sometimes built very close to the sea	Infrastructure: Increasing risk of damage to government property, with negative impacts on basic services (hospital and health services, school and education, government housing)
Sexual and Reproductive Health and Rights		
Nutrition and Food Security		

	Fresh water and sanitation: Traditional practices of defecating on the beach cause algal bloom and ultimately can lead to health problems.	Fresh water and sanitation: Increasing risks of contaminating the Tarawa lagoon with sewage, with impacts on health of people and the marine habitat. Increasing pressure on women and their families from reduced access to freshwater.
	Fisheries and Food Security: Gaps in monitoring of ciguatera outbreaks, other outbreaks and coral reef bleaching and collaborative actions with the Ministry of Health and Medical Services	
		Education and human resources: Schools, students, teachers and trainers are affected by climate change and hazards in relation to their safety, food security, access to drinking water, ability to commute and health

	Health: Existing high levels of diarrhoeal diseases, infant mortality and malnutrition among children and the elderly. Inefficient distribution of fresh water. Unprotected sources of drinking water (especially wells). A large proportion of households use the beach, bush, lagoon and sea for toileting. Difficulties in avoiding bacterial and chemical contamination of water reservoirs: coliform counts frequently exceed World Health Organization (WHO) guidelines, in both reticulated water supplies and wells. Difficulties in maintaining high standards of food hygiene. Presence of breeding sites for mosquito vector (<i>Aedes aegypti</i>), including abandoned vehicles and solid waste in proximity to settlements (e.g. South Tarawa) Changes in lifestyle, including poorer nutrition and less physical exercise, leading to a higher level of noncommunicable diseases. Low immune status of the population and gaps in effective health care; access to health services especially limited in outer islands. Lack of specialised knowledge to conduct health assessments/tests and treat health problems, e.g., health staff lack capacity to differentiate between food poisoning and ciguatera. The health information system is still struggling to provide sufficient, accurate and timely information for decision making in planning, strategy and policy development. This is also true for disease surveillance and	Diminishing water safety and increase in water-borne diseases: increasing risk of diarrhoeal diseases due to runoff following heavy rains and contamination of drinking water sources. Densely populated areas are at high risk. Diminishing food safety and increase in food-borne diseases: As temperatures rise, the risk of enteric infections transmitted by food increases (especially illnesses caused by salmonella, campylobacter, and a wide range of enteroviruses). The risk is especially high in crowded conditions. High population density increasing risk of rapid transmission of infectious diseases. Increase in vector-borne diseases, especially dengue fever. During warmer and wetter conditions, outbreaks increase (already observed during El Niño events and wet season). Higher dependence on food imports with low nutritional value leads to increasing noncommunicable diseases. Increasing cost of healthcare.
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	response systems, which are currently not meeting internationally agreed standards. Gaps in data storage and monitoring and collaborative actions with Ministry of Fisheries and Marine Resources Development (MFMRD), Ministry of Environment, Lands and Agriculture Development (MELAD) and Ministry of Public Works and Utilities (MPWU).	
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Sector	Strategy	Programmes	Key Adaptation Priorities
Waterborne disease			

Vector-borne disease	Strategy 5: Strengthening health-service delivery to address climate change impacts		
Non-Communicable Disease			Reduce incidence of noncommunicable diseases and mental health issues (research and publicize nutrition content of local foods).
Mental Health		5.1 The public is aware of water safety and proactively reduces the spread of vector, water and food-borne diseases.	
Sexual and Reproductive Health and Rights			5.2. Key National Adaptation Priority – Health Security Routine systems for surveillance of environmental health hazards and climate-sensitive diseases are strengthened and the capacity of national and local health systems, institutions and personnel to manage climate change- and disaster-related health risks are enhanced. Strengthen health intervention programmes for monitoring, surveying and responding to climate-sensitive, climate-induced and disaster-related diseases.
		5.3 Capacities are enhanced, and equipment provided to the MHMS Central Laboratory and	Key National Adaptation Priority – Health Security

		Environmental Health Laboratory to test water and food, conduct vector control activities and analyse results. 5.4 I-Kiribati population's general health status is enhanced to be more resilient to climate-related diseases and health impacts. 5.5 A national climate change, disaster risk, outbreak preparedness governance framework, response plan and a sectoral environmental health plan, which incorporate surveillance and response to climate sensitive diseases and disaster risks, are in place.	Develop a governance framework to guide the health sector's work on climate change and disaster risk reduction ; Improve management, coordination and implementation of health security programmes
			5.6 Key National Adaptation Priority – Health Security #5. Strengthened support for retrofitting medical facilities and health infrastructure adversely affected by, or susceptible to, the impacts of climate change.
			5.7 Key National Adaptation Priority – Health Security

			#6. Enhanced chemical waste management and alternatives to reduce contamination and pollution.
Nutrition and Food Security	4: Increasing water and food security with integrated and sector specific approaches and promoting healthy and resilient ecosystems	4.1 Communities with island councils manage and implement climate change adaptation and disaster risk reduction measures as an integral part of their development efforts and inclusive of vulnerable groups.	Environmental Sustainability And Resilience Strengthen institutional capacity and the framework for effective conservation and sustainable use of natural resources and effective licensing and enforcement systems to protect the environment and enhance the resilience of the people of Kiribati.
		4.2 Salt-, drought-, rain- & heat stress-resilient crops, fruit, vegetables and livestock breeds are identified and promoted, and communities preserve local food (fruit trees and seafood)	Food Security Strengthen the capability of communities to take practical and sustainable measures to address food and nutrition security. Increase understanding and community ownership of assets and practices related to food and nutrition security (behavioural change); Improve food preservation and storage techniques to avoid food shortages and increase food availability through use of both modern and traditional skills and knowledge.

		4.3 Communities manage coastal fisheries taking into consideration sustainability of marine resources as well as climate change and disaster risks. 4.4 Communities have constant access to local produce and basic food commodities.	Food Security Strengthen the institutional and technical capacities of various key sectors for a coordinated whole-of-government approach to improve local food production and address issues with imported food commodities.
		4.5 Communities manage their water resources, including during extreme events such as drought, heavy rain and storm surges	Water Security Strengthening communities' engagement in safeguarding water sources and improving water systems.

13. National Adaptation Plan of Kuwait

The overall objective of the National Adaptation Plan (NAP) of Kuwait is to provide an integrated development plan and subsequent programmes targeting local communities and environmental components in areas under the threat of climate change. NAP covers **four** sectors: Marine and fisheries, water resources, coastal zone, and health.

Kuwait NAP Summary (2019-2030)					
Sector	Prime tasks of the Health Regions	Climate stressors	Risks	Adaptation Projects/Initiatives	Major Gaps in the Human Health Sector

Waterborne disease	1.Carrying out the ministry's plans to confirm and protect health services for the people of the area; 2.Providing training of all kinds for the body of professionals employed; 3.Offering every health care possible; 4.Introducing and perfecting a digital and computerized system of health data for residents in the area.	Increases in occurrence and severity of dust storms	Threaten asthma patients	1.Implementing green belts project and increasing the protected areas to adapt to dust storms 2.Kuwait's agricultural efforts to mitigate climate change in 2012 3. eMISK Industry 4. Awareness Campaign 5. Beatona Initiative 6.Adjust the official working hours Initiative Source	1.Insufficient climatic information and early warning systems to provide alerts before extreme weather events such as dust storms. 2. Lack of awareness of the public and the media about climate change impacts on health, and adaptation measures. 3. Lack of communication, access to data and information on climate change caused diseases such as their life cycle, distribution and geographical spread in Kuwait. 4. Inadequate integration of health into adaptation and development plans and other sector plans and policies in Kuwait. 5. Lack of financial and physical capacities among health-care units and practitioners as well as a lack of public awareness in addressing and
Vector-borne disease			Degradation of air quality		
Non-Communicable Disease			Obstruction of human activities		
Mental Health		Increased Temperature	Increases health service expenditure		
Sexual and Reproductive Health and Rights			Threaten people's lives		
			Increases health service expenditure		

					understanding climate change impacts on health.
Nutrition and Food Security					

Adaptation Plans to enhance the resilience of the Health Sector:

Enhance and building the capacity of the health sector to be prepared for increased health risks due to climate change	
Summary	The association between asthma and dust events and risks of heat waves are clear examples of harsh environmental impact on the human health on Kuwait. Dust storms and extreme weather events (thunderstorms, heavy rainfall, heat waves, and flash floods) are expected to be severe and more frequent due to climate change. Factors contributing to asthma issues are believed to be related to the air quality. The project helps to adapt the climate change impacts in the public health sector. The project aimed to collect the previous data of air quality and weather data and to evaluate and review them against existing air regulations. Gaps and improvement opportunities were identified. The project has created the National Emissions Database Implemented an Air Quality Management Information System (AQMIS).
Ongoing Project	eMISK Industry. Warning systems for sandstorms. Kuwait Integrated Environmental Management System(KIEMS)

Gaps	Insufficient climatic information and early warning systems to provide alerts before extreme weather events such as dust storms. Lack of awareness of the public and the media about climate change impacts on health, and adaptation measures. Lack of communication, access to data and information on climate change caused diseases. Inadequate integration of health into adaptation and development plans and other sector plans and policies in Kuwait. Lack of financial and physical capacities among health-care units and practitioners as well as a lack of public awareness in addressing and understanding the climate change impacts on health.
Physical Effects	Increased dust events. Increased heat waves. Heavy rain and flash flood Thunderstorms and associated Asthma events.
Vulnerabilities	Increased risks of food and water-borne diseases Decreased air quality
Impacts	Increased risks of injuries and deaths due to heat waves Increased risks of chronic diseases, such as asthma
Socio economic Risks	Loss of work capacity and productivity The increased cost of asthma treatment due to the increasing number of patients. Increased energy & economic demand for cooling.

Short term actions	Increase public awareness of climate changes effects and impacts on general health. Conduct risk assessments and vulnerability to Climate Change on the general public. Involve the media in carrying the message of issues of Health, as people get more influenced and receive the message more directly and subconsciously through advertisement and social media sites. Adjust the official working hours to avoid working during maximum temperatures in the day (study and issue a new threshold). Raising awareness of how to respond to dust and heat waves events. Establishing national health alerts for dust storms and heat waves.
Medium term actions	Develop warning systems for extreme weather conditions combined with a communication strategy for alerts. Increase drought-proof vegetation to reduce dust fallout from dust storms
Long-term actions	Include information and instructions about Climate Change Effects on Health in the early education curriculum. Establish a research and monitoring network on climate and health, with a focus on analyzing the expected climate change impact on health.
Budget	4.1 million USD.
Responsibility	Ministry of Health Ministry of Higher Education Ministry of Electricity and Water KEPA. Ministry of Finance. Ministry of Services Affairs. Ministry of Information

	Meteorological department – Civil Aviation
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14. National Adaptation Plan of Liberia:

The objectives for the NAP document are to:

Provide a framework and procedures for sharing of information of scientific, technical, and traditional knowledge on climate change risk management and develop capacity-building measures;

Coordinate sectors and related government and private land-use institutions on climate change risk management using awareness with a focus on the improvement of climate risk management actions and

Work with the priority sectors to identify and propose measures to promote adaptation to reduce climate change risk.

In the NAP of Liberia, health is mentioned as one of the climate-sensitive factors.

Liberia NAP Summary (2020-2030)				
Sector	Sector	Climate stressors	Climate change risk	Adaptation Strategies/Activities
Waterborne disease	Health	Increased temperatures	Increased incidence of vector-borne diseases (e.g., malaria, dengue fever, and yellow fever) due to the extended breeding range to higher elevations	Develop and implement a program for climate-proofing new investments in infrastructure (roads, sewers, water supplies, and other infrastructure) in coastal settlements and rural areas to protect continuous access
Vector-borne disease				
Non-Communicable Disease				
Mental Health				
Sexual and Reproductive Health and Rights		Increased frequency of intense precipitation	Emerging and re-emerging water and foodborne disease	

				to livelihoods, health care, and education.
			Exacerbation of respiratory diseases (e.g., asthma)	
Nutrition and Food Security		Climate-induced changes in the biophysical characteristics of marine and freshwater areas in Liberia	Extreme events will significantly affect the ecosystems that support fish (especially inland). This will affect food security in multiple ways.	Improving food security through smart agriculture practices and facilitating access to Liberia ONE Health system.

15. National Adaptation Plan of Nepal

Nepal NAP Summary (2012-2050)				
Sector	Programme Title	Objectives	Timeframe	Budget (Million USD)

Waterborne disease				
Vector-borne disease				
Non-Communicable Disease				
Mental Health	Capacity Building of Health and Hygiene Service Providers (Institution and Personnel) on Climate Resilient Health and Hygiene Service Planning and Implementation	Empower and inform healthcare providers to respond to climate risk and vulnerabilities. Ensure sustainable and safe water, sanitation, and health care waste services management. Ensure use of sustainable energy (renewable) in health care facilities and services. Develop and promote climate resilient infrastructure, to enable efficient functioning of health care facilities during extreme weather events.	2025-2030	50
Sexual and Reproductive Health and Rights				
	Climate Change Resilience Development through Capacity Building, Innovation, Improvement and Construction of WASH Services and Facilities	Capacitate and aware stakeholders on climate-resilient WASH interventions. Explore and pilot technologies to implement climate-resilient water supply, systems and sanitation services.	2030-2050	2000

		Develop climate-resilient water supply system, and sanitation services and facilities focusing on Gender, Children Youth and overall social inclusion Design and implementation of climate-proofing of WASH services. Promote adaptive water sanitation and hygiene practices to reduce the impact on the environment and climate. Support local government to establish and operationalize water-quality monitoring mechanism through various local and national initiatives.		
	Strengthening of Climate Sensitive Disease Surveillance System with Emergency Preparedness and Response	Operationalize a disease surveillance system 2 through adoption of appropriate technology and tools. Generate evidence and support in evidence- based decision-making in regard to climate sensitive diseases. Integrate climate change and health issues in academic curriculum. Strengthen and equip public health laboratories to better assess climate-sensitive diseases, Prevent and control life losses and disabilities to due to emergencies created by climate-induced extreme events. Enhance capacity of health services and responders to act swiftly in the case of climate emergencies.	2030	500

		Strengthen the rapid and emergency response system. Build capacity of the federal, provincial, and local-level public health emergency operations centres,		
	Health Promoting Cities: Health, Environment and Life (HEAL)	Improve the health and quality of life of all urban and rural dwellers. Ensure adequate open spaces and parks for healthy behaviors. Improve environmental health services (water supply, sanitation, solid waste management food safety, and air pollution monitoring and control). Increase urban forests coverage and conserve an ecosystem that is stable and sustainable, Promote clean, safe physical environment of high-quality including housing quality.	2030-2050	500
	Promotion and Conservation of Water Sources along with Watershed Management for Sustainable Water Supply Service	Support local governments in the conservation of water sources (surface and ground) Promote and support watershed management for sustainable water supply service delivery. Promote and support water recharge and retention activities.	2030	1000
	Policy Reform, Strategy Development and National Level Awareness Raising on Climate Resilient Health and WASH Programme, Planning	Policy reform and/or formulation to make climate-sensitive WASH, Health plans and program	2030	200

	Operationalization and Sustainability	Support local government on integration and implementation of climate change adaptation in local-level WASH and health plans and programs, Develop national guidelines and strategies to support local government to integrate multiple uses of water, water quality improvement systems, insurance and hybrid technologies. Operationalize National Health and WASH Management Information System integrating with hydro-meteorological land-use data for climate-sensitive planning. implementation and monitoring.		
	Research, Innovation and Development of Climate Resilient Measures/ Technologies for Water Supply Sanitation and Health Systems	Explore climate-resilient technologies for water and sanitation that are suitable for the local context Explore resources and partnerships for scaling up identified climate-resilient WASH technologies and businesses (Supply to Service) through engagement of the private sector and industries Build the capacities of service providers WASH practitioners, and local governments to adopt innovative technologies Develop early warning systems for water source (surface and ground) yield demand. and quality.	2030	500
Nutrition and Food Security				

16. National Adaptation Plan of Palestine (2016)

Sector	Health	Adaptation option	Adaptive capacity
Waterborne disease	Due to a lack of safe drinking water and sanitation services, the health of women and children, in particular, is being adversely affected. Water shortages and sanitation problems cause particularly acute problems for women, increasing domestic work burdens and the incidence of water-borne diseases among family members. Water-related diseases account for approximately 26% of diseases in the Gaza Strip and are the primary cause of child morbidity. In 2009, diarrhea was the cause of 12% of infant and young child deaths in the Gaza strip, despite being preventable and easily treated	Development of water, food and sanitation monitoring and safety systems using high technology Training health professionals and increasing the awareness of people, particularly women, in water-poor areas about measures they can take to help prevent major diseases related to water, sanitation, and food.	Insufficient resources to develop adequate water and sanitation infrastructure, and to expand community-based behaviour-centred p A shortage of specialized health workers and emigration of qualified personnel Lack of alternative plans and funding for emergency situations Israel's occupation, blockade and restrictions on movement and access restrictions, which impede effective action on inter-related crises, e.g. in relation to water supplies or food production
Vector-borne disease			
Non-Communicable Disease			
Mental Health			
Sexual and Reproductive Health and Rights			
Nutrition and Food Security			

17. National Adaptation Plan of Sierra Leone (2019-2030)

Sierra Leone has one of the highest malnutrition and child mortality rates in the world, making the country's population extremely vulnerable to climate shocks. Incidents of high-temperature morbidity and mortality are projected to increase. Rising temperatures are also associated with increased episodes of

diarrhoeal diseases, seafood poisoning and increases in dangerous pollutants. As temperatures increase above 25°C, malaria infection is expected to rise. The country's Ebola outbreak revealed a deficient health system, including understaffed, unavailable, or unaffordable health care that will be further stressed by climate change impacts (USAID, 2016).

NAP Summary Sierra Leone (2019-2030)	
Health	Priority Actions
Waterborne disease	Waterborne diseases are also expected to increase with more frequent and intense flooding. Currently, heavy rains have increased the likelihood of the outbreak of communicable diseases. More intense dry seasons (with increased temperatures) in the north and west have been linked to reduced water quality and disease outbreaks. The last major cholera epidemic outbreak in 2012 caused 300 deaths and affected more than 20,000 people.
Vector-borne disease	Malaria is the most common cause of illness and death in the country, with malaria-related illnesses contributing to 38 percent of child and 25 percent of all-age mortality rates. The most vulnerable groups include children aged under 5 years and pregnant women
Non-Communicable Disease	•Programme Improve climate change adaptation infrastructure across priority sectors (Enhance waste management systems at all levels to reduce pollution and greenhouse gas emissions to improve the health of both humans and animals and reduce climate change •Mainstream climate change adaptation considerations into sectoral plans and strategies (Strengthen integration of climate change adaptation into the health sector)
Mental Health	
Sexual and Reproductive Health and Rights	
Nutrition and Food Security	Rice is the staple food crop in Sierra Leone and is grown mainly by small-scale farmers under rain-fed conditions. This makes agriculture and farmers' livelihoods especially vulnerable to changes in precipitation. Increasing temperatures, changing precipitation patterns, and increased intensity and

	frequency of extreme events such as droughts, threaten agricultural production and food security, which could lead to food shortages, hunger, and malnutrition. Water shortages could also lead to the loss of food production and the necessity to import.
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18. National Adaptation Plan of South Africa

Health is considered a priority adaptation-related sector for South Africa, as identified in the NCCRP.

South Africa NAP Summary				
Sector	Priority Sector	Sensitivity Analysis	Exposure Analysis	Adaptation Actions
Waterborne disease	Health			
Vector-borne disease				
Non-Communicable Disease				
Mental Health				

Sexual and Reproductive Health and Rights		Quadruple burden of disease Poor housing, infrastructure and service delivery Change in the distribution of diseases Catastrophic events may affect the health of the population	A changing climate can have myriad impacts on the health sector. There is a lack of understanding of the linkages between climate and health in South Africa (e.g. quantitative link between high temperatures and mortality).	Improving health care can help to build the resilience of communities to better cope with climate change impacts Equip and capacitate emergency response departments, such as health and fire, to prepare for and manage climate-related disasters. This will involve continued capacity building of emergency response workers to provide them with the skills to respond to and manage climate change-related incidents. It will also include equipping the emergency response infrastructure. Launch an enhanced climate change public flagship programme to build a healthier, more resilient society. Equip and capacitate healthcare facilities to manage climate change related health effects and climate sensitive diseases.
Nutrition and Food Security				Promote the expansion of food garden programmes outside of land classified as agricultural land or farmland to reduce food insecurity and hunger Support small-scale fishers (male and female) to become more climate resilient through the use of early warning systems and sea safety training

				Support farmers (male and female) to implement more efficient climate-smart and conservation agricultural practices. Enhance the role of agricultural extension officers in supporting the most vulnerable farmers (male and female). Invest in knowledge and capacity building for climate-resilient rural homestead gardening.
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19. National Adaptation Plan of South Sudan

The objectives of the NAP are:

To reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience;

To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes, and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

The NAP of South Sudan identified health as one of the prioritized sectors.

South Sudan NAP Summary			
Sector	Priority Sector	Programme	Impacts

Waterborne disease	Disaster Risk Reduction	Programme 3: Enhancing community awareness and preparedness for climate shocks and disasters DRR 3.2 Reduce water-borne diseases due to flooding and river overflow resulting from climate extremes. Develop mechanisms to reduce water-borne diseases with a complementary awareness-raising program.	Floods increase water-borne diseases and create breeding grounds for disease-carrying insects like mosquitoes. Increased water-borne diseases and the prevalence of malaria and typhoid fever washed away houses, lead to displacement and damaged crops and farmland
Vector-borne disease		Programme 1: Improve health sector capacities to address climate change-related health threats Hel 1.5 Develop action plans and strategies to control infectious diseases and vectors. Programme 3: Improve public awareness of health threats and adaptive capacity to address threats. Hel 3.5 Develop low-cost, user-friendly blueprints for latrines, hand washing stations and other public facilities to minimize vector promotion of diseases.	Changes in climate are likely to lengthen the transmission seasons of important vector-borne diseases and to alter their geographic range

Non-Communicable Disease			
Mental Health	Health	Programme 1: Improve health sector capacities to address climate change-related health threats Hel 1.1 Conduct comprehensive vulnerability assessments in the health sector under current and future climate change scenarios. Hel 1.2 Mainstream climate change, including future climate scenarios, into health sector strategies, plans and policies. Hel 1.3 Establish a research program to understand the impacts of climate change on the health of vulnerable groups. Hel 1.4 Establish a training program on climate change-related health risks for health sector workers, with a special focus on community health workers (CHW). Programme 2: Establish early warning capabilities for climate change-related health threats Hel 2.1 Establish a surveillance system for tracking current and emerging disease risks. Hel 2.2 Develop monitoring guidelines and train CHWs to monitor climate change-related health threats.	Changes in climate can cause mental health issues, especially among youth, those dependent on agriculture, and internally displaced people.

		Hel 2.3 Expand capacity for modelling and forecasting climate-related health effects. Hel 2.4 Develop risk maps to identify areas and populations most susceptible to climate change-related health hazards (e.g., heat, disease). Hel 2.5 Develop health hazard forecasting products for early warning based on climate and meteorological data. Hel 2.6 Develop and implement preparedness and response plans for health threats (e.g., heat waves, diseases). Programme 3: Improve public awareness of health threats and adaptive capacity to address threats. Hel 3.1 Develop, disseminate and implement guidance and provide capacity building support to state and local health sector officials on health effects of climate change at national and subnational levels. Hel 3.2 Promote climate health education in school curricula. Hel 3.3 Establish targeted public information and messaging campaign to promote risk-reducing behavior change in communities and to raise awareness on climate change-induced diseases, with special emphasis on highly vulnerable groups.	
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		Hel 3.4 Build capacity to consider climate change related health threats in urban, rural and regional planning. Programme 4: Establish partnerships to address health threats from climate change Hel 4.1 Develop, disseminate and implement health guidelines for other line agencies to encourage multifunctional use of new buildings to provide public health benefits (e.g., cooling centres). Hel 4.2 Work with cellular companies to explore partnerships to provide early warning messages and other information via SMS. Hel 4.3 Coordinate with Department of Climate Change to develop risk indicators, data/information sources and data management protocols for monitoring and early warning systems.	
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		Hel 4.4 Incorporate innovative architectural designs into new schools and develop siting guidelines to reduce adverse impacts of climate change (e.g., heat) on students. Hel 4.5 Establish learning and knowledge sharing partnerships with other countries in the region for health adaptation and innovation.	
Sexual and Reproductive Health and Rights			
Nutrition and Food Security	Agriculture, Livestock and Fisheries	Programme 3: Supporting climate resilient agriculture practices A 3.2 Improve animal health systems to reduce the vulnerability of pastoral communities to climate change.	Stunting and malnutrition due to decreased food security and injuries and mental health issues resulting from increased disasters. Increased temperatures have biophysical impacts on many economically and nutritionally important plant species. Crops such as wheat and sorghum and maize reach their thermal maximum temperatures, thus producing lower yields.
		Policy/ Strategy Document	Linkage/ Relevance to NAP Process

		National Policy on Food Security, 2012	The National Policy on Food Security recognizes natural disasters as threats to national food security, including droughts, floods, pests and diseases, attributing the cause of these disasters to climate variability and change. The policy identifies development of drought- and flood-resistant seed varieties as one way to build adaptive capacity.
		Fisheries Policy Framework, 2006	This policy recognizes the potential for food security and poverty alleviation. The policy acknowledges key constraints and recommends relevant programs of activities to improve food security. The policy aims for increased fish production, income generation, infrastructure development, research and training, and aquaculture development.

20. National Adaptation Plan of Sudan:

Sudan's Initial National Communication identified agriculture, water and health as the highest priority sectors where urgent and immediate adaptation action is needed to confront increasing climatic variability and climate change.

Sudan NAP Summary

Region	Public Health
West Darfur	Climate change could accelerate the spread of malaria, yellow fever and cholera. Although the provision of basic health services and health education among locals will be a necessary element to adaptation, more studies are needed to understand the link between rising temperatures, water stress and the spread of these diseases, particularly in the context of Western Darfur.
Central Darfur	Adaptation in the health sector should include rural public health awareness programs regarding measures to protect against community diseases and vectors, particularly among children.
East Darfur	Adaptation in the health sector should include capacity building among rural health personnel, rural public health awareness programs, installation of rural health centers, and increased access to standard vaccines.
Kordofan States	The potential appearance of new skin diseases, such as Jarab, will require additional basic health services.
Kassala	Increasing temperatures threaten to accelerate and extend the spread dengue fever and malaria, which are already prevalent in Kassala. This can be offset first by more entomological surveys, proper solid waste disposal and construction of communal latrines in agricultural villages. Water treatment plans for agricultural villages would prevent villagers from drinking non-potable water from irrigating canals
Gedarif	Gedarif state is the southernmost state in the Eastern State and receives enough rain to sustain a healthy agricultural sector
River Nile State	Adaptation measures in this sector focus on vaccination campaigns and awareness-raising program on key preventable diseases such as schistosomiasis.
Northern State	Adaptation measures focus on providing health services to the Umm Gawaseer area could alleviate health risks from the spread of new skin diseases as well as the lack of potable water
Khartoum	Major adaptation activities include ensuring adequate treatment supplies for vector-borne diseases and improving health awareness among rural communities.

Blue Nile State	Major adaptation activities include improving rural health services and capacity building around early detection of malnutrition in rural communities.
Sennar State	Major adaptation activities include improving rural health services and ensuring access to safe drinking water.

Priority Adaptation Measures for Darfur States		
Health Sector	Capacity Building	Scientific Research
Programme: Reducing Climate Induced Diseases & Mortalities 1. Combating vectors and insects that borne diseases. 2. Improving primary health care services 3. Providing services for a healthy environment. 4. Improving the general health services and build awareness.	Programme: Increasing Production and Productivity through the technical cadres and the CBOs 1. Building the capacities of all the relevant stakeholders in adaptation to climate change. 2. Raising awareness about building resilience in the agricultural, water and health sectors.	Development and dissemination of technologies for adaptation to the impacts of climate change in the agricultural, water and health sectors.

State-level Summary:

West Darfur State:

	Climate Factors	Impacts	Non-Climate Factors	Adaptation Activities
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Health Sector	Increase of temperature Decrease of rainfall amount and variability of rainfall Decrease of relative humidity Drought Increase of wind speed	Spread of diseases that relate to water such as malaria and skin diseases. Spread of epidemics such as yellow fever and cholera Spread of malnutrition diseases	Poverty Illiteracy Lack of health awareness Civil conflicts Lack of Health services in the area Lack of nutritional education Lack of finance Interaction with neighboring countries	Project anti-vector-borne diseases and insects Project to improve basic healthcare services. Project to improve environmental sanitation services. Project to upgrade health services.
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South Darfur State:

Health Sector	Climate Factors	Impacts	Non-Climate Factors	Projects
	Drought Floods and events of High rainfall High temperature	Occurrence of diseases due to lack of water such as skin and eye infections Diarrhea Scabies. Water related vector diseases such as Malaria and Flarias Waterborne diseases such as cholera, Typhoid and dysentery.	Poverty Population Movement and Displacement Lack of health awareness	Programme: Eradication of Schistosomiasis(bilharzias), Intestinal worms, Malaria and leishmaniasis Improve the environment, Health education and mass communication Community Empowerment raise the technical capacity of services to local communities (Mobile Klink.) Provision of clean safe water. Provisions of Treatment.

		Water based disease such as schistosomiasis Poor air quality Allergies and other nuisances		Capacity building. Partnerships to coordinate with partner agencies within the UN system. Endemic disease control. Advocacy Health system strengthening
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East Durfar State:

Health Sector	Climate Factors	Impacts	Non-Climate Factors	Adaptation Programmes
	High temperature Drought Dust storms	Inflammations Epidemic diseases Meningitis Diarrhea	Poverty Low of health awareness Management	Provision of vaccines Rehabilitation of personnel health Created health centers Guidance and preventive health

Priority Adaptation Measures for Kordofan States	
Specific Objectives	Health Sector
To diversify incomes and reduce poverty To increase productivity.	Health Program

To attain rational use of natural resources. To provide potable water and other basic services (e.g.health and education) Enhancing the participation of women and youth in the development process and in environmental conservation.	Establishment and rehabilitation of health centers Building the capacities of the health cadres Supporting family and school health programs Promotion of ventilated improved latrines Combating transmitted disease Raising the health awareness of the communities
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State-level Summary:

Area	Climate Factors	Impacts	Non-Climate Factors	Adaptation Programmes
North Kordofan States	Decrease in rainfall amount high variability in rainfall amount and distribution Lack of water Increase of temperature Drought Windstorm	Malnutrition diseases Spread of Malaria disease Respiratory system disease Lack of awareness Increase of waterborne diseases Eyes diseases	Poverty Lack of awareness High cost of living and limited income Migration Poor environment activities and lack of awareness	Construction of health units, well-equipped and run by qualified medical cadres Cleaning and purification of drinking water Construction of latrines in village Provision of drinking water Conducting research studies on different waterborne diseases in Rahad Awareness raising of local people Training and capacity building for local health committees
South Kordofan States	Low rainfall High temperature Desertification Floods	Diseases Hunger death Conflicts War Migration	Legislation awareness Migration	Increased the health unit cadre. Awareness raising of women on hygiene, environmental health and harmful social practices. Maintenance of health units and supply of drugs and training of health cadre

Western Kordofan States	Low rainfall High temperature Floods	Diseases Hunger death Conflicts War Migration Epidemic disease	Weakness of Legislation Migration Lack of awareness, laws and sanctions	Improving economic situation awareness, legislation, provision of health services, capacity building
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Priority Adaptation Measures for Eastern States	
Specific Objectives	Health Sector
Program: Health Improvement Component: Establishment of dispensaries and health centers Provision of primary health care services Raising health awareness Provision of water quality testing equipment	Policies and Other Measures Provision of primary health services

State-level Summary:

Area	Climate Factors	Non-Climate Factors	Impacts	Adaptation Programmes
Kassala State	Fluctuation of rainfall Increase of temperature Drought and flood cycle	Civil war in the eastern region and neighboring countries Refugees influx and internal displacement Migration of rural residents into urban areas. Poverty and epidemic disease e.g. tuberculosis High percentage of illiteracy within rural people Desertification and Spread of mesquite trees	Spread of Malaria and tropical disease	Emphasis to control diseases like malaria and tuberculosis. Eradication of mosquito from potential water resources
Gadaref State	Scarcity and fluctuation of rainfall Increase of temperature Increase in frequency of drought and floods	Spread of water related diseases and insects Increase in malnutrition, disease Emergence of common diseases High ratios of maternal and child mortality	water pollution Lack of health education Illiteracy Poor training and lack of assistive device Lack of hygienic water sources Displacement and migration	The components are: Establishment of health centers and units Adoption of control measure for Malaria schistosomiasis kalazaar and sunstroke Waste collection and recycling Improvement of toilets systems

		Increase of illiteracy Health disasters		Providing water testing equipment Awareness raising
Red Sea State	Decrease in rainfall Drought High temperature Floods	Socio- economic factors related to attitudes & behavior. Occupational factors	Shortage and pollution of water Spread of diseases such diarrhea, malaria and bilharzias, malnutrition Increase of morbidity rates of the stated diseases	Environmental health & Health hygiene Provision of health services for the control of Dengue fever Heat stroke, Malaria Malnutrition

Priority adaptation measures for Nile States	
Goal	Health Sector
Vulnerability Reduction and Building Resilience in the Agricultural, Water and Health Sectors to Achieve Sustainable Development	Objective: Reducing the incidence of climate change related diseases 1.Primary health care. 2.Environmental health 3.Vectors control 4.Water-borne diseases.

	5.Epidemics early warning systems
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State-level Summary:

Area	Climate Factors	Non-Climate Factors	Impacts	Adaptation Activities
River Nile State	Decrease of rainfall Increase of temperature Increase frequencies of drought and flood cycle	Increase of poverty rate Illegal Cutting of trees over-grazing of range lands Absence of environmental effective laws and legislations Migration Lack of finance Lack of supporting policies Deforestation	Increase of poverty rate Increase migration and displacement. Lack of finance Lack of supporting policies. Increase in the cost of production. Increase of desertification. Domination of unpalatable grasses and disappearance of palatable species. Increase of soil erosion rate	Environmental improvement projects Agricultural production projects Agricultural research projects Agricultural extension program Vaccination campaigns Livestock restocking Water harvesting program Wells drilling and installation of pumps(Provision of Pumping sets) Construction of feeding canals along the Nile and River Atbara Control of Riverbank erosion Malaria eradication projects First healthcare projects Environmental healthcare Water sanitation project

				Establishment of rural latrines
North State	High temperature High humidity Severe winds	Poverty, low income, human behaviors, clean water shortage, socioeconomic factors, air pollution, the use of chemicals substance like mercury	Decrease human outcome, increasing of respiratory, eye and communicable disease, allergic and skin disease, urinary tract infection	Provision of basic health services, malaria eradication program, raising awareness and establishment of treatment centers, capacity building
Khartoum State	Temperature Drought Flood Dust storms	Migration Poverty Influence of refugees & IDPs Food shortage Water shortage Sanitation problems Sewage & drinking water Supply and insufficiency Range land degradation Increase of food cost Decrease of insect natural enemies such as reptiles & birds	Malnutrition Meningitis Respiratory diseases Change of insect vector distribution pattern Thermal stress specially for elderly people & infant Spread of endemic diseases during disasters Increase of infant mortality rate Spread of endemic diseases in new site and bringing unexpected diseases that are not recorded in the state Waterborne diseases	Early Warning of the Spread of Disease Vectors Health awareness Creating partnership at all levels to face health risks resulted from climate change Vector control chemical & Environmental control Cases treatment Insurance of medicines stock during disasters & emergency Improvement) of livestock health by vaccination, training of workers and veterinary guidance Rehabilitation of rangelands Afforestation

		Weakness high cost of health services The numbers of patient exceed the capacity of health care system	Spread of fungal disease due to drought Spread of cutaneous leishmaniasis due to rain delay	
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Priority adaptation measures for Central States	
Health Sector	Policies Objectives and Measures
(C) Programme: Control of Endemic and Epidemic Diseases Induced by Climate Change Components: 1. Control of Schistosomiasis, Leishmaniasis, Dengue, Fever, Malaria and Lymphatic filariasis. 2. Control of malnutrition and diarrhea among children under five. 3. Provision of treatment and basic medical services. 4. Building institutional and human capacities. 5. Early-warning and response to health emergencies.	Improving the working environment and provision of the basic infrastructure in the health, water and agricultural sectors. Improving the primary health care services, epidemics control and reduction of climate change induced diseases. Provision of primary health care services, eradication of endemic diseases and dissemination of healthy environment principles and preventive health attitudes.

State-level Summary:

Area	Climate Factors	Non-Climate Factors	Impacts	Adaptation Activities
Gezara State	Rainfall Floods Temperature Solar Radiation heatwave of summer Wind speed Relative humidity Drought	Desertification Water scarcity Lack of safe water Famine Open defecation & urination	Flood causes drowning and physical injuries, damage homes and disrupts the supply of medical and health services. Meningitis spread of flies i.e. Typhoid fever, diarrheal diseases. Spread of some diseases e.g. diarrheal diseases Arthritis, Reduction of human production capacity Floods contaminate freshwater supplies, heighten the risk of water-borne diseases, and create breeding grounds for disease carrying insects such as mosquitoes. Epidemic diseases i.e. diarrheal diseases, Increase in diseases malaria, dysentery, cholera	To raise awareness on climate change and human health Health education and training Support technology transfer Education into water, sanitation and hygiene and livelihood projects. Improve drug supply through Revolving Drug Fund Increase capacity in local health policy and program implementation Research on climate vector borne diseases
Sennar State	Fluctuation of rainfall Increase of temperature Increased frequency of drought and flood cycle	Increase of displacement Accumulation of animals around water resources Wars and conflicts Malnutrition	Lack of safe drinking water Pollution of drinking water Increase of epidemics Increase of morbidity and mortality rates Appearance of new diseases Spread of malaria	Provision of safe drinking water Extension and awareness raising programmes Establishment of health units and insurance Provision of medicines

Blue State	Nile	Fluctuation in the amount of rainfall High temperature Floods Activity and speed of the wind	Poor roads Illiteracy resulting from poor health awareness. Weak health services Lack of health staff	Spread of malnutrition and disease epidemics (cholera-diarrhea-malaria) Outbreak of meningitis Spread worms Alfrendid and viral hepatitis and scabies	Provision of medicines and vaccines for diarrhea, malaria and pesticides to combat the worm Frendid Provisions of health insurance for local communities Training on the rapid detection of malaria Training volunteers to detect early cases of malnutrition Training of health workers in cases of epidemics Implementation of environment sanitation campaigns and health education
White State	Nile	Rainfall fluctuation Increasing temperature Winds and storms Drought Delay in rainy season	Low training and awareness Use of deep plowing in Goz. Illegal felling. Poverty and low-income resources Migration from rural to urban areas. Spread of pests and diseases		

5-Years Budget: Priority Adaptation Measures for the 18 States of Sudan:

Custer of States	Adaptation Programmes and Measures		Cost(USD)
Darfour States	Health Sector adaptation		10500
	Resilience in the agricultural, water and health sectors and building		5100
Kordofan States	Health Sector adaptation		11000
Eastern States	Health Improvement		10000
Nile States	Health Sector adaptation		10050
Central States	Control of Endemic and Epidemic Diseases induced by Climate Change		13200

Gaps and needs for further work to strengthen the NAP process:

Methods and tools: Building technical capacity and knowledge about methods and tools (impacts models) for assessing future impacts of climate change and assessment of future vulnerability of the water, agriculture and food security and health sectors and their implication on national development.

21. National Adaptation Plan of Timor Leste (2020-2024)

The HNAP was produced by the Ministry of Health and is currently being finalized. The HNAP provides some baseline information on health indicators and describes the primary threats to health associated with changing climate and environmental conditions. The HNAP acknowledges the need for intersectoral coordination since some environmental health issues are not within the control of MoH. The HNAP provides the overall strategic direction for strengthening health systems to protect health from climate change. It identifies and addresses medium- and long-term adaptation needs, including upstream drivers of health risks, taking into consideration the physical, social, and biological determinants of health. It is envisaged that the HNAP will facilitate increased access to climate adaptation finance by identifying entry points in the health sector.

Sector	Adaptation priority programs	Indicative Climate Change vulnerabilities to Strategic Development Plan 2011-2030 priorities	Indicative Climate Impacts
	Integrating climate change considerations into health sector planning and regulatory frameworks Improving health sector capacities for managing climate risks.	Goal: By 2030, Timor-Leste will have a healthier population as a result of comprehensive high-quality health services accessible to all Timorese people. In turn, this will have reduced poverty, raised income levels, and improved national productivity	Increasing temperature will increase heat-related illness and mortality, and could lead to the spread of vector-borne diseases. Increased disaster frequency and intensity has a range of implications for health. Climate impacts on agricultural productivity will indirectly impact health by threatening food security.
Waterborne disease	Currently, in Timor-Leste, it is estimated that 70 children under the age of 5 die every day because of diarrheal illnesses caused by poor water and sanitation		
Vector-borne disease	The most common health risks posed by climate change in Timor-Leste include vector-borne diseases such as malaria and dengue fever, heat-related mortality, undernutrition, diarrheal diseases, and disruption to healthcare		

	services due to extreme weather events.		
Non-Communicable Disease			
Mental Health			
Sexual and Reproductive Health and Rights	Though much progress has been made in improving women 's health over the past decades, overall indicators suggest that in general women 's health remains poor, particularly in rural areas and amongst poorer women. Women face many barriers in accessing health care information and services, including long travel times to health facilities, poor roads and transport, and cultural norms discouraging them from leaving home to seek healthcare (Indevia 2018).		
Nutrition and Food Security	The Government of Timor-Leste is working to achieve its national food security by using local and imported nutritive food for its citizens. The National Food and Nutrition Security		

	Policy was approved in 2017 with the vision that by 2030 Timor-Leste will be free from hunger and malnutrition Timorese people will enjoy healthy and productive lives, and people in Timor-Leste will be well-fed principally from an increased variety of locally-produced and imported nutritious food and in the meantime, carefully manage the country agro-ecosystem to significantly improve and increase food production in Timor-Leste		
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NAP Summary Timor Leste (2020-2024)	
Health Vulnerability and Adaptation Assessment	Major gaps identified in the health sector
Under high-emissions scenarios, heat-related mortality among elderly residents is projected to increase significantly (from a baseline of zero deaths between 1961-1990); • Improved research capabilities to examine the linkages between climate/weather-related phenomena and health impacts and disease incidence are needed; • Surveillance and early warning systems for disease vectors should be improved, and data sharing between different agencies to inform these systems should be improved;	Establish a coordination mechanism between the implementation of the National Adaptation Plan and a Health National Adaptation Plan; Significant gaps in data records as well as observation and monitoring networks. The HNAP observes weaknesses with respect to public health and disaster related data collection and analysis, hindering the assessment of risk and vulnerability at different levels. Surveillance with respect to diseases is rudimentary, and in general there is a lack of research, research capacity, and research support infrastructure for the health sector and other priority sectors.

• There is a need to mainstream climate change into new policies and programs related to climate-sensitive diseases and risks, including mainstreaming of both CCA and DRR/DRM considerations into the Timor-Leste National Health Sector Strategic Plan 2011-2030 during the mid-term review and four-year comprehensive evaluation processes; • There is a need to enhance the capacities within MoH and among other stakeholders to address the health risks of climate change, including general awareness-raising activities and improving access to finance for adaptation activities; The assessment also concludes that higher temperatures and longer heat waves are expected to increase the incidence of heat-related diseases. However, municipality and village level vulnerability assessments have not been undertaken (MoH and WHO 2018).	
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22. National Adaptation Plan of Suriname (2019-2029)

NAP Summary (2019-2029)			
Sector	Overview of the Country Specific NAP Model	Roadmap for Action	Key Performance Indicators of health:
	Cross foundational support sectors These sectors are the foundation of long-term building of national economic wealth, sustainability, resilience and	Pathway for Cross-Foundation Sectors: There are two foundation sectors upon which the productive sectors and the cross-collaborative sectors depend. These are the education	Expansion of preventative care programs Area of country monitored Reduced frequency and intensity of outbreaks

	sustained development. The sectors clustered here are: education and health. While both these sectors require adaptation attention in and of themselves, their underlying foundational support for all other sectors is important.	and health sectors. Long term resilience cannot be confidently built without first paying substantial attention to these two sectors. There should be strong emphasis on building resilience in the education and health sectors. Over time through the medium and long term, while resiliency must be maintained in these sectors, the foundation would have been sufficiently strengthened so as to shift focus from building up resilience to maintaining it.	Capacity assessment of healthcare system implemented Number of foreign-local linkages Health care professionals trained in climate and health related areas Engagement between practitioners and communities Increase in public awareness Public access to feedback mechanisms Health and climate risk maps developed Number of healthcare indicators monitored Regularization of healthcare capacity reviews Increase in surveillance programs Increased risk mapping Increased early warning systems
Waterborne disease			
Vector-borne disease			
Non-Communicable Disease			
Mental Health			

Sexual and Reproductive Health and Rights			
Nutrition and Food Security	At the sectoral level, for the agriculture sector, emphasis was placed on food security and food safety.		

23. National Adaptation Plan of Sri Lanka (2016-2025)

Sri Lanka has reported relatively high achievements in the health sector compared with other developing nations. The country has recently experienced an outbreak of diseases that are closely connected with the environment and weather patterns. Sri Lanka has an ageing population which would particularly be vulnerable to climate-related health hazards. Hence, serious effort towards adaptation against potential health hazards associated with climate change is a priority.

NAP Summary Sri Lanka (2016-2025)			
Sector	Sector Action Plan - Health	Priority Actions	Adaptation options Actions responsible
Waterborne disease		Conduct research studies on the impact of climate change prevalence and spread of vector-borne and pathogenic diseases	Conduct research studies on the impact of climate change on the prevalence and spread of Vector bone diseases/ Pathogenic diseases.

Vector-borne disease	The spread of vector-borne diseases into new areas with changing patterns of local climate is a potential health hazard that needs close attention. Sri Lanka has a history of epidemics in the past such as periodic outbreaks of malaria.	Develop research institutes' capacity to research the health impacts of climate change Strengthen the mechanisms for sharing information between disaster management and health management agencies Launch awareness programs on climate and health risks for healthcare workers and the public	Assess critical factors for controlling climate-induced disease incidents Identify plausible strategies for the management of climate-induced disease incidents Establish a surveillance program for the detection and monitoring of climate-induced disease Prepare vulnerability maps on climate-related health hazards Strengthen the alertness of the health system against climate-induced disease incidents Launch an awareness program on climate and health risks for - Healthcare workers/Public Develop research institutes' capacity for conducting research on climate and health issues including multidisciplinary collaborative research. Strengthen the mechanism for sharing information between disaster management and health management agencies Develop disaster risk preparedness guidelines for health workers in vulnerable areas. Conduct research studies on the health impacts of climate-altering pollutants (Focus availability, temporal variation, and health impacts)
Non-Communicable Disease	Assess and prepare for the increased health risks due to climate-induced vector-borne and pathogenic diseases		
Mental Health	Minimize the health hazards associated with increased incidence of extreme events		
Sexual and Reproductive Health and Rights	- Assess and prepare for health risks caused by the concentration of climate-altering pollutants - Assess the impact on health due to increased heat and thermal stress		

Nutrition and Food Security	Priority Actions Develop tolerant varieties (paddy, OFC, horticulture) and breeds (livestock and poultry) to heat stress, drought, and floods and resistant to diseases and pest attacks Develop and promote water-efficient farming methods. Adjust cropping calendars according to climate forecasts. Develop systems for timely issuing and communicating of climate information to farmers. Develop research institute capacity for researching tolerant varieties/breeds and climate-resilient farming method. Enhance the resilience of crops, animals, fish, and agroecosystems against heat and water stress Minimize the risk of crop and health damage due to biological agents	Sector Action Plan – Food Security Develop heat-tolerant breeds (Focus on livestock and poultry) Reduce field-level irrigation water losses Promote micro-irrigation techniques Develop water-efficient farming methods Promote on-farm rainwater harvesting Promote the reuse of wastewater Improve cropping systems and conservation Improve nursery protection Increase the use of organic matter to improve soil quality (Integrated plant nutrient management. Promote low-water demanding crops and varieties and crop diversification (Focus: Dry and intermediate zones) Promote the intensive management of livestock Develop pest-resistant varieties Adjust cropping calendars according to the seasonal weather forecasts	Train health workers on environmental health and safety Increase public awareness of the health risks of heat /thermal stress
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	Minimize the impact of food security due to erratic changes in precipitation. Enhance the resilience of crops, animals, fish, and agroecosystems to extreme weather events Minimize the impacts of sea level rise on agriculture in the coastal zone. Assess the changes in the oceanic environment and impacts on livelihood and food security	Diversify into livestock feeds other than naturally grown pasture Promote techniques of fodder production and conservation Strengthen the seawater defense structures to control seawater intrusions to coastal paddy lands.	
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24. **National Adaptation Plan of St Lucia (2018-2028)**

NAP Summary St Lucia (2018-2028)			
Sector	Potential climate change impacts on Saint Lucia's health sector	The NAP has been formulated to:	NAP health goals:
	Injuries and deaths resulting from direct hazard impacts on people (e.g. drowning during flooding and from infrastructure or trees striking people) during extreme events. Outbreaks of water-borne and food-borne diseases, such as schistosomiasis and cholera, dengue, leptospirosis, and yellow fever, after flooding events. increased pollution of water sources (sewage, solid waste, industrial/ hazardous chemicals/ waste) during flooding episodes could increase the incidence of skin, gastric, and multiple other problems associated with the contamination of water and food supplies Increased levels of malnutrition due to extreme weather events related to declining crop and livestock production, loss of primary incomes, and increasing food cost Higher levels of human exposure to pesticides (including in food content) due to their	Offer guidance for the integration of climate change adaptation considerations into ongoing, planned, and emerging decision-making processes in the 7 national development sectors/areas deemed most vulnerable to climate impacts by stakeholders. The priority sectors/areas are water, agriculture and fisheries, infrastructure and spatial planning, natural resource management (terrestrial, coastal, and marine), education, and health.	Enhanced enabling environment for health related climate adaptation action Improved public health under a changing climate Strengthened preparedness to climate variability and extremes

	increased use to control pest infestation after extreme events. Severed access to health services for vulnerable communities during and in the aftermath of extreme weather events (either because transport and communication are cut or because the events directly affect exposed health system infrastructure) Heat stress and cardio- and cerebrovascular conditions resulting from extreme temperature are likely to increase Higher temperatures associated with heat waves could alter the geographical distribution of the mosquito species that transmit deadly diseases such as dengue.		
Waterborne disease			
Vector-borne disease	Under a changing climate, Saint Lucia could see its freshwater resources dwindle; and suffer from the effects of more intense floods and a higher incidence of water, food, and vector-borne diseases (such as dengue). It is expected that the country's terrestrial and marine ecosystems and biodiversity will see changes in habitat conditions and species will be lost		
Non-Communicable Disease			

Mental Health			
Sexual and Reproductive Health and Rights			
Nutrition and Food Security	Increased levels of malnutrition due to extreme weather events-related declining crop and livestock production, loss of primary incomes, and increasing food costs Declining crop yields and livestock production with higher temperatures and dry periods are expected to add to the malnutrition burden in the country. The intrusion of seawater into freshwater lenses, particularly in low-lying coastal areas, further reduces the availability and quality of freshwater. · Irrigation with increasingly brackish water reduces crop production and salinizes soils, affecting food security and quality.		

25. Joint National Action Plan of Tonga:

Tonga JNAP Summary (2018-2028)				
Sector	Objective and Sub-Objective	Activities	Means of Verification	Indicator

Waterborne disease	Objective: Mainstreaming for a resilient Tonga Sub-objective 1.3.: Develop and implement prioritized sector resilient plans such as biodiversity, education, energy, fisheries, forestry, health, infrastructure, land, water, and youth, including supporting policies and legislation where necessary.	1.3.1 Conduct sector-specific vulnerability assessments to establish baselines and to inform resilience planning	A published set of guidelines based on the targets for a Resilient Tonga by the of March 2018	Provision of Monitoring and Evaluation reports from all sector plan developments to the Monitoring and Evaluation staff member on the JNAP Secretariat
Vector-borne disease		1.3.2 Priority sectors resilient plans to be developed, integrating gender, youth, and people with disabilities and other vulnerabilities. These must be costed and fully aligned with the JNAP2 adapted targets for a Resilient Tonga.	Health sector plan developed by the end of 2018.	Health sector plan published, approved by Parliament and disseminated.
Non-Communicable Disease		1.3.3 Develop multi-hazard disaster preparedness, response and recovery plans for priority sectors including regular drill exercises.	Revised tourism sector plan developed by the end of 2018.	Revised tourism sector plan published, approved by Parliament and disseminated.
Mental Health		1.3.4 Review, and if necessary, revise the new forestry plan to ensure that it is fully aligned with JNAP 2 adapted targets for a Resilient Tonga	Education sector plan developed by the end of 2018.	Education sector plan published, approved by Parliament and disseminated.
Sexual and Reproductive Health and Rights				
Nutrition and Food Security		1.3.5 Review, and if necessary, revise the new water resources supply and management plan to ensure that it is	Revised youth sector plan developed by the end of 2018.	Revised youth sector plan published, approved by Parliament and disseminated.

		fully aligned with the JNAP adapted targets for a Resilient Tonga		
		1.3.6 Develop a national coastal zone management plan and national land use plan integrating the adapted JNAP targets for a Resilient Tonga	New agriculture sector plan developed by 2021.	New agriculture sector plan published, approved by Parliament and disseminated.
		1.3.7 Review the National Biodiversity Strategy and Action Plan	New fisheries sector plan developed by 2025	New fisheries sector plan published, approved by Parliament and disseminated.
		1.3.8 Complete studies to determine what is required for Tonga to achieve 100 percent renewable energy uptake by 2035;	Review of forestry plan completed by the end of 2018	Revised forestry plan published, approved by Parliament and disseminated.
		1.3.9. Develop Tonga's National Determined Contributions (NDC) Stock Take and reporting to the UNFCCC Conference of Parties (COP) under the Paris Agreement by 2020	Review of water resources supply and management plan completed by the end of 2018	Revised water resources supply and management plan published, approved by Parliament and disseminated.
		1.3.10. Develop a new energy sector plan based on lessons learnt from the Tonga Road Map aimed at achieving the goal of 100 percent renewable energy by 2035, and consistent with Tonga's NDC.	National coastal zone management plan and national land use plan developed by the end of 2020	National coastal zone management plan and national land use plans published, approved by Parliament and disseminated.

		1.3.11. Complete specific studies to determine the feasibility for Tonga to transition away from petrol and diesel (alternative sources) in the transport sector (shipping and vehicles);	Revised NBSAP by the end of 2017	NBSAP revised, published and disseminated.
		1.3.12. Develop a Tonga Climate Change Management Act	Background studies are completed by the end of 2019.	Background studies are published and disseminated.

Sector	General Information	Climate factor	Impacted Sector	Likely Impact
Waterborne disease		Temperature	Health	Heat stress on people and the ecosystem
Vector-borne disease	Dengue fever, Zika virus and Chikungunya are transmitted by Aedes aegypti mosquitoes. With increasing rainfall and increased settlement of Tongans from outer islands to swampy areas of Nuku'alofa, the spread of dengue fever reached epidemic proportions in 2014 and 2016.		Agriculture	Reduced fisheries catches
Non-Communicable Disease	The protection of health facilities against climate change and disaster impacts throughout Tonga is crucial. There is a need for a systematic evaluation of all health facilities in Tonga to determine their capacities to withstand extreme weather	Rainfall	Health	Wetter in wet season causing flood damage, increasing mosquito breeding areas, thus

	developing secure and sustainable water supplies (roof collection into underground tanks), energy independence (solar power systems), and climate proofing of buildings.			increases of dengue fever cases.
Mental Health			Agriculture	Drier in dry season impacting on agriculture and forestry
Sexual and Reproductive Health and Rights				
Nutrition and Food Security	The vulnerability of Tonga's agriculture sector is also exacerbated by an increasing lack of access to arable land. Land shortages are caused by the urban footprint of an expanding population, particularly with significant levels of migration to Tongatapu, but also because of a loss of access to bush allotments. In 2015, nearly 60% of households on Tongatapu, and 40% on Vava'u, nearly 40% on 'Eua and Ha'apai and 20% on the two Niuas did not have bush allotments (Agriculture Census 2015). This places limits the growth of agricultural production, reduces the flexibility of the agriculture sector to adapt to climate change, and threatens domestic food security. The fisheries sector in Tonga remains productive and contributes significantly to Tonga's economy. Both inshore (shallow water and reef) and offshore (oceanic and deep-sea) fisheries contribute to food security, sustenance and income earning of coastal communities and the country of Tonga			

List of Contributors

The Comprehensive Climate Change and Health National Adaptation Plan (C3HNAP) was developed with invaluable input from a wide range of stakeholders, including government institutions, academic institutions, non-governmental organizations, and experts in climate change, public health, and other relevant fields. Their collective expertise and commitment to addressing climate-related health challenges were instrumental in the creation of this plan. For the development of the C3HNAP, the following members of the Technical Advisor Group (TAG) and the Technical Working Group (TWG) were involved:

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National Validation Workshop, Dhaka

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Date : 23 December 2024
Sonargaon Dhaka

Time : 9.30 am – 2.00 pm

Venue : Pan Pacific

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55	Dr. Md Zillur Rahman	Professor and Chairman, DSCR, DU
56	Dr. Md. Shakhawat Hossain	Associate Professor, DSCR, DU
57	Professor Dr. Md. Rabiul Haque	Professor, Department of Population Sciences, DU
58	S M Mahbubur rahman	Executive Director, Institute of Water Modelling
59	Mohammad Saiful Alam Khan	Deputy Manager (Strategic Planning & Business Development), Institute of Water Modelling
60	Md. Rafiqul Islam	Managing Director (Additional Secretary), BCCT
61	Sheikh Maniruzzaman	Director (Planning, Development & Negotiation), BCCT
62	Md. Yusuf Mehedi	Assistant Director (Admin & Finance), BCCT
63	Razwanur Rahman	DG, DDM
64	Engr.Tushar Mohon Shadhu Khan	Chief Engineer
65	Mohammad. Anwar Eusuf	Superintending Engineer (Planning Circle)
66	Bidhan Chandra Dey	Superintending Engineer (Ground Water Circle)
67	Dr. Md Shadekul Alam	Director, BMD
68	Dr. Md. Shameem Hassan Bhuyian	Deputy Director, Storm Warning Centre
69	Brig. General Imru-al-Quais	Chief Health Officer, DNCC
70	Dr.Fazle Shamsul Kabir	Chief Health Officer (In-Charge), DSCC
71	Malik Fida A Khan	Executive Director (In Charge), CEGIS
72	Ms Roufa Khanum	Assistant Director, C3ER, BRAC University
73	Ms. Sharmin Nahar Nipa	Coordinator, C3ER, BRAC University
74	Mr. Fazle Rabbi Sadik Ahmed	Deputy Managing Director, PKSF
75	Md. Enamul Karim Pavel	Head of Renewable Energy, IDCOL
76	Md. Sabbir Hossain	Senior Officer, GCF, IDCOL
77	Dr. A Atiqur Rahman	BCAS
78	Dr Md Liakath Ali	Director, climate change programme, Brac
79	Dr Golam Rabbani	Head of Climate Bridge Fund secretariate at BRAC
80	SM Manzoor Ahmed Hanifi, PhD	Scientist, HSPSD, icddr,b
81	Arif Mohammad Faisal	Program Specialist, UNDP
83	Dr. Zahirul Islam Kochi	Swedish Embassy
84	Fahmida Shabnam	Leader, Human Capital Team, FCDO
85	Rashid Zaman	Health Adviser, FCDO
86	Shafiqul Islam	Health Adviser, FCDO
87	Fawzia nasrin	Programme Manager, Health, FCDO
88	Dr. Arefin Amal Islam	Country Director at Noora Health

89	Shirin Lira	Programme Manager, Governance, Climate Change and Environment, Noora Health
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90	Farah Kabir	Ex-Officio Secretary; Country Director, Action Aid
91	Hasin jahan	Country Director, Water AID
92	Mr. Raquibul Amin	Country Representative International Union for Conservation of Nature (IUCN) Bangladesh
93	Runa Khan	Founder & Executive Director, Friendship
94	Sayed Rubayet	Country Director, IPAS
95	Abdus Salam	Managing Director, PHD
96	Fatema Showkat Jahan Rojy	Senior Deputy Director, PHD
97	Prof Dr Abu Jamil Faisel	President-elect, Public Health Association of Bangladesh
98	Vibhavendra Raghuyamshi	Chief,Health, UNFPA, Bangladesh
99	Abu Sayed Hasan	SRHR Specialist, UNFPA Bangladesh
100	Azmal Hossain	Urban Health, Programme Analyst, UNFPA Bangladesh
101	Md. Helal Uddin	Consultant, SRHR Policy and Planning
102	Nargis Akter	NPO-Wash, CC & Environment
103	Md. Zahidur Rahim	Health Cluster Focal, WHO

Annex-3

Participants List

Divisional workshop on “Climate- resilient comprehensive Health Adaptation Plan”
at Khulna, Bangladesh

Venue: Banquet Hall, Hotel Castle Salam		
Sl No	Name	Designation & Organization
	Resource Persons	
1.	Prof. Dr. Ainun Nishat	Ex VC, BRAC University and Chairman, Technical Advisory Group, CCHPU
2.	Dr. Nurul Kadir	Additional Secretary, (Climate Change) Ministry of Environment, Forestry and Climate Change
3.	Dr. Asaduzzaman	Consulted, GIZ
4.	Parveen Akter	Joint Secretary, (Public Health) Health Service Division, Ministry of Health and family Welfare
5.	Tanvir Ahmed	Deputy Secretary, (Public Health) Health Service Division, Ministry of Health and family Welfare
6.	Mr. Md. Motahar Hossain	Deputy Secretary, (WH-1), Health Service Division, Ministry of Health and family Welfare
7.	Md. Hafizur rahman Chowdhury	Deputy Secretary, (WH-2), Health Service Division, Ministry of Health and family Welfare
8.	Forid Hasan Ahmed	Development Consulted
9.	Shakila Yesmin	Assistant Director, (Planning) Bangladesh Climate Change Trust
10.	Dr Iqbal Kabir, PhD	Coordinator, CCHPU and Associate Professor and Head of the Department, Epidemiology Department, NIPSOM
11.	Dr. Md. Abdul Kadir	Director, (Health) Khulna Division, Khulna
12.	Mohammed Faruk Hossan	Additional, Divisional Commissioner
13.	Md. Shariful Islam	Director, Family Planning, Khulna Division, Khulna
14.	Md. Habibul Haque Khan	Director, Department of Environment & Climate Change, Khulna Division, Khulna
15.	Md. Mahbubur Rahman	Regional, Deputy Forest Conservator, Khulna Division, Khulna
16.		Superintendent Khulna Medical College Hospital, Khulna
17.	Dr. Md. Rafiqul Islam	Assistant Director, (Administration) Khulna Division, Khulna
18.	Dr. Syed Jahangir Hossain	Assistant Director, (Disease Control) Khulna Division, Khulna
19.	Dr. ASM Abdur Razzaque	Civil Surgeon, Khulna

	Participants From CCHPU	
20.	Dr. Dewan Mashrur Hossain	Medical Officer, CCHPU
21.	Syed Istiak Ahmed	Program Officer, CCHPU
22.	Mehruba Sharmin	Research Associate, CCHPU
23.	Anju Akter	Research Officer, CCHPU
24.	Mohiuddin	Start Station, CCHPU
25.	Abdus Sattar	Finance Assistant, CCHPU
26.	Md Mahabub Alam	Office Assistant, CCHPU
	Participants From Save the children	
27.	Istiak Mannan	Deputy Country Director, Program Operation, Save she children
28.	Mostak Hossain	Humanitarian Director, Save The Children
29.	Shamim Jahan	Health Nutrition and HIV/AIDS, Save the children
30.	Syed Matiul Ahsan	Deputy Director, DRR&CCA, Save the children
31.	Md. Forhad Hossain	Senior Officer-Climate Change, Save the children
32.	Ferdous-ur Rahman	Executive Director, Prodipon
33.	Md. Abdullah Syed	Representative, Prodipon
34.	Md. Badrul Alam Talukder	Representative, Save the children
35.	Md. Liakot Hossain	Representative, Save the children
36.	Md. Azahar Ali Morol	Head Master, Bastuhara High School, Representative, Save the children
37.	Md. Yunus Ali	Head Master, Shohid Titumir High School, Representative, Save the children
38.	S. M. Harun Harun-or-Rashid	Head Master, Divisional Post Office High School, Representative, Save the children
39.	Sheikh Forhadul Islam	Assistant Teacher, PMG High School, Representative, Save the children
	District Level Participants	
40.		District Commissioner, Khulna

41.	Nargis Parvin	District Commissioner, Bagerhat
42.	Anindita Roy	Additional District Commissioner, Satkhira
43.		Civil Surgeon, Bagerhat
44.	Dr. Tauhidur Rahman	Civil Surgeon, Satkhira
45.	Dr. Dilip Kumar Roy	Civil Surgeon, Jessore
46.	Dr. Md. Asad-uz-Zama Munshi	Civil Surgeon, Narail
47.	Dr. Rasheda Sultana	Civil Surgeon, Jhenaidah
48.	Dr. Md. Abdul Hai	Civil Surgeon, Magura
49.	Dr. Md. Khairul Alam	Civil Surgeon, Chuadanga
50.	Dr. H M Anwarul Islam	Civil Surgeon, Meherpur (in-Charge)
51.		Civil Surgeon, Kustia
52.		Additional District Commissioner, (Overall) Khulna
53.	Dr. Mahabubur Rahman	Residential Medical Officer, General Hospital, Khulna
54.	Guru Prashad Ghosh	Deputy Director, Family Planning, Khulna
55.	Md. Abdul Alim	Deputy Director, Family Planning, Bagerhat
56.	Rowshon Ara Zaman	Deputy Director, Family Planning, Satkhira
57.	Md. Soddiquir Rahman	Deputy Director, Family Planning, Jessore
58.	Md. Shamsul Alam	Deputy Director, Family Planning, Narail
59.	Md. Zahid Ahmed	Deputy Director, Family Planning, Jhenaidah
60.	Md. Abdur Razzaque	Deputy Director, Family Planning, Magura
61.	Md. Moniruzzaman	Deputy Director, Family Planning, Chuadanga
62.	Bikash Kumar Das	Deputy Director, Family Planning, Meherpur
63.	Sarder Md Hannan	Deputy Director, Family Planning, Kustia
64.		Executive Engineer, Department of Public Health Engineering, Khulna

65.	S. M Anayet Kabir	Executive Engineer, Department of Public Health Engineering, Bagerhat
66.	Nasrin Akter	Assistant Engineer, Department of Public Health Engineering, Bagerhat
67.		Executive Engineer, Department of Public Health Engineering, Satkhira
68.		Deputy Civil Surgeon, Khulna
69.	Dr. Pulok Debnath	Deputy Civil Surgeon, Bagerhat
70.		Deputy Civil Surgeon, Satkhira
71.	Md. Abul Kalam Azad	Senior Officer, (Health Education) Civil Surgeon Office, Khulna
72.	Md. Arifuzzaman	Start Station, Civil Surgeon Office, Khulna
73.	Md. Zobair Hossain	Assistant chief (MIS) Director, Department of Health
	Upazila Level participants	
74.	Dr. Md Mozammel Haque	UH&FPO, Dacop, Khulna
75.	Dr. Ram Chandra Sha	UH&FPO, Batiaghata, Khulna
76.		UH&FPO, Dumuria, Khulna
77.	Dr. Md. Nazrul Islam	UH&FPO, Piakgacha, khulna
78.	Dr. Sujat Ahmed	UH&FPO, Koyra, Khulna
79.	Dr. Sheikh Md. Mosharaf Hossain	UH&FPO, Bagerhat Sadar (on behalf of CS bagerhat)
80.	Dr. Kamal Hossain Mufti	UH&FPO, Morrelganj, Bagerhat
81.	Dr. Ashim Kumar Samaddar	UH&FPO, Sarankhola, Bagerhat
82.	Dr. Jibitosh Biswas	UH&FPO, Mongla, Bagerhat
83.	Dr. Arun Ku Banarji	UH&FPO, Assasuni, Satkhira
84.	Dr. Shuva Rani Debnath	UH&FPO, Shyamnagar, Satkhira
85.	Dr. Aksedur Rahman	UH&FPO, Kaliganj, Satkhira
86.	Dr. Md. Abdul Latif	UH&FPO, Debhata, Satkhira
	NGO	

87.	Sk. Mostafizur Rahman	Assistant Director, and Chief of Disaster Management Unit, Shushilon, Khulna
88.	Md. Zahidur Rahman	Deputy Chief of Party, Nabojattra, (World Vision Bangladesh) Khulna
89.	Swapon Kumar Guha	Executive Director, Rupantor, Khulna
90.		Health Officer, Khulna Field Office, Unicef, Bangladesh
91.	Kabir Ahmed	Unit Manager, RHSTEP, Khulna
92.	Md. Ibrahim Bhuiyan	Representative , RHSTEP, Khulna
	Media	
93.	Javed Iqbal	Deputy Director, Divisional District information Office, Khulna
94.	Millik Shudhanshu	General Editor, Press Club, Khulna
95.	S.M Zahid Hossain	Bangladesh Sonbad Sangstha and Daily Observar
96.	Ehasan	Reporter, Prothom Alo
97.	Subir Roy	Reporter, Doinik Purbachol
98.	Md. Amirul Islam	Reporter, DBC News

Participants List

**Divisional workshop on “Climate- resilient comprehensive Health Adaptation Plan”
at Barishal, Bangladesh**

Venue: Banquet Hall, Hotel Grand Park		
Sl No	Name	Designation & Organization
1.	Md. Habibur Rahman Khan	Additional Secretary (WH & PH), Health Service Division, MOHFW
2.	Prof. Dr. Ainun Nishat	Ex VC, BRAC University
3.	Parveen Akter	Additional Secretary (PH), Health Service Division, MOHFW
4.	Dipak Kanti Paul	Managing Director (additional Secretary), BCCT, Ministry of Environment, Forest & Climate Change
5.	Dr. Zahirul Islam	Health Advisor, Embassy of Sweden
6.	Md. Farid Hasan Ahmed	Development advocate and climate specialist
7.	Dr. Iqbal Kabir	Coordinator, Climate Change and Health Promotion Unit
8.	Dr. Md. Mahabubur Rahman	Divisional Director, Health, Barisal
9.	Md. Shariful Islam	Divisional Director, Family Planning, Barisal
10.	AHM Rashed	Assistant Director, Environment, Barisal
11.	Md. Abdul Latif	Divisional Director, Disaster Management, Barisal
12.	Dr. Bashudev kumar Das	Deputy Director, Health, Barisal
13.	Dr. Shaymol Krishna Mandol	Asst Director, Admin, DD Office, Barisal
14.	Dr. Md. Abdul Jabber Howlader	Asst Director, Disease Control, DD Office, Barisal
15.	Dr. Rezaul Amin Howlader	Asst Director, Dental, DD Office, Barisal
16.	Md. Shahidul Islam	Asst Divisional Director, Family Planning, Barisal
17.	Md. Arefin Badal	Asst Divisional Director, Directorate of Environment, Barisal
18.	Ram Chandra Das	Divisional Commissioner, Barisal
19.	Md. Khairul Alam Sheikh	Additional Divisional Commissioner, (overall) Barisal
20.	S.M. Ajior Rahman	District Commissioner, Barisal
21.	Kabir Mahmud	District Commissioner, Barguna
22.	Mohammed Masud Alam Siddik	District Commissioner, Bhola
23.	Md. Hamidul Haque	District Commissioner, Jhalokathi

24.	Md. Motiul Islam Chowdhury	District Commissioner, Patuakhali
25.	Abu Ali Md Shazzad Hossain	District Commissioner, Pirojpur
26.	Dr. Md. Monower Hossain	Civil Surgeon, Barisal
27.	Dr. Md. Humayun Shaheen Khan	Civil Surgeon, Barguna
28.	Dr. Rathindra Nath Majumder	Civil Surgeon, Bhola
29.	Dr. Shyamol Krishna Howlader	Civil Surgeon, Jhalokathi
30.	Dr. Shah Mozahedul Islam	Civil Surgeon, Patuakhali
31.	Dr. Md Faruque Alam	Civil Surgeon, Pirojpur
32.	Dr. Md. Taiabur Rahman	Deputy Director, Family Planning, Barisal
33.	Taposh kumer shill	Deputy Director, Family Planning, Barguna
34.	Mahmudul Haque Azad	Deputy Director, Family Planning, Bhola
35.	Ferdausi Begum	Deputy Director, Family Planning, Jhalokathi
36.	Dr. Md. Jashim Uddin	Deputy Director, Family Planning, Patuakhali
37.	Ram krishna Dash	Deputy Director, Family Planning, Pirojpur
38.	Md. Monirul Hasan	Executive Engineer, DPHE, Barisal
39.	Mirza Nazmul Hassan	Executive Engineer, DPHE, Barguna
40.	Akmol Hossain	Executive Engineer, DPHE, Bhola
41.	Badsha Mia	Executive Engineer, DPHE, Jhalokathi
42.	Fayez Ahmed	Executive Engineer, DPHE, Patuakhali
43.	Md. Humayun Kabir	Executive Engineer, DPHE, Pirojpur
44.	Dr. Md. Delware Hossain	Residential Medical Officer, General Hospital, Barisal
45.	Dr. Md Mamun-ur-Rashid	UH&FPO Hizla, (Barisal District)
46.	Dr. Masumul Huq Khan	UH&FPO Patharghata (Barguna District)
47.	Dr. Shovon Kumar Basak	UH&FPO Char Fasson, (Bhola District)
48.	Dr. Md. Mahabubur Rahman	UH&FPO Rajapur (Jhalokathi District)
49.	Dr. Chinmay Biswas	UH&FPO Kalapara, (Patuakhali District)
50.	Dr. Md. Siddikur Rahman	UH&FPO Kawkhali, (Pirojpur District)
51.	Dr. Md. Manirul Islam	UH&FPO Golachipa (Patuakhali District)

52.	Md. Tanvir Rahman	UNO, Kalapara, (Patuakhali District)
53.	Sah Md. Rafikul Islam	UNO, Galachipa, (Patuakhali District)
54.	Md Saidul Haque	Health Specialist, PLAN International
55.	Shakila Islam	Coordinator, Youth Net
56.	Kazi Enayet Hossain	Managing Director, SCOPE
57.	Md. Faruq Hossain	Senior Manager, Save the Children, Bangladesh
58.	Kazi Jahangir kabir	Executive Director, SAINT Bangladesh
59.	Hasina Begum Nila	Executive Director, SUVO
60.	Shohamur Rahman	Coordinator, Youth for Climate
61.	Mithun Saha	Barishal Correspondent, Baishakhi TV
62.	Moinul Islam Sabuj	Staff Reporter, Daily Kalerkantha
63.	Shapon Khondoker	Executive Editor, Anadalikhon
64.	Sushanta Ghosh	Barishal Correspondent, The Daily Star
65.	Siddiqur Rahman	Staff Correspondent, Barishal 24 hrs
66.	Md. Kamruzzaman Juel Rana	Dainik Ajkerbarta
67.	Dr. Dewan Mashrur Hossain	Medical Officer, CCHPU
68.	Syed Istiak Ahmed	Office Manager, CCHPU
69.	Mehruba Sharmin	Research Associate, CCHPU
70.	Dr. Margub Aref Jahangir	Health Officer (EPI & MNCH), Health Section, UNICEF Bangladesh
71.	Dr, Hari Krishna Banskota	UNICEF
72.	Mr. AH Towfique Ahmed	CFO, UNICEF, Barisal
73.	Dr. Sabrina Rafi	Health Officer, UNICEF, Barisal
74.	Roma Saha	Nutrition Officer, UNICEF, Barisal
75.	Asif Mainur Chowdhury	Consultant, UNICEF
76.	Forkan Ahmed	Community Officer, UNICEF, Barisal

Participants List

Divisional workshop on “Climate- resilient comprehensive Health
Adaptation Plan” at Chottogram, Bangladesh

Venue: Hotel Agrabad		
Sl No	Name	Designation & Organization
1.	Md. Habibur Rahman Khan	Additional Secretary (Admin Wing), Health Services Division, MOHFW
2.	Parveen Akter	Additional Secretary (PH), Health Service Division, MOHFW
3.	Tanvir Ahmed	Deputy secretary (PH-1), Health Services Division, MOHFW
4.	Md. Mokhtar Ahmad	Director (Planning, Development & Negotiation)&Secretary, BCCT, Ministry of Environment, Forest& Climate Change
5.	Prof Dr Md. Iqbal Kabir	Coordinator, Climate Change and Health Promotion Unit
6.	Shakila Yasmin	Assistant Director (Development), BCCT
7.	Md. Farid Hasan Ahmed	Development advocate and climate specialist
8.	Mohammad Golam Nabi	Independent Communications Consultant
9.	Dr Hasan Shariar Kabir	Divisional Director, Health, Chottogram
10.	Mr Nurul Alam Nizami	Additional Commissioner, Chottogram Division
11.	Md. Moajjem Hossain	Divisional Director, Environment, Chottogram
12.	Md. Bokhtiar Noor Siddique	Divisional Forest Officer, Chottogram (North)
13.	Mono Kumar Roy	Divisional Director (Family Planning), Chottogram
14.	Dr. Md Abdus Salam	Deputy Director (Health), Chottogram
15.	Dr. Md Shafiqul Islam	Assistant Director (Admin), Divisional Director(Health)office, Chottogram
16.	Md. Abul Kalam Azad	District Relief & Rehabilitation Officer, Chittagong
17.	Dr. EU Khe Uin	Deputy Director, Family Planning, Chottogram
18.	Amir Hossain	Assistant Director, Family Planning, Chottogram
19.	Muktadir Hasan	Deputy Director (Environment), Chottogram
20.	Md. Kamal Hossain	Additional District Commissioner, Chottogram
21.	Dr. Md. Azizur Rahman Siddique	Civil Surgeon, Chottogram

22.	Shumon Roy	Executive Engineer, DPHE, Chattogram
23.	Dr. Dinesh Chandra Shil	RMO, General Hospital, Chottogram
24.	Md. Mahbubul Karim	UNO, Pekua, Cox's Bazar
25.	Dr. S A Matin	Civil Surgeon, Cox's Bazar
26.	Charaj Ahamad	Rep. Deputy Director, Family Planning, Cox'sBazar
27.	Rittik Chowdhury	Executive Engineer, DPHE, Cox'sBazar
28.	Md. Shaed Iqbal	UNO, Alikadam, Bandarban
29.	Dr. Aung Sui Pru Marma	Civil Surgeon, Bandarban
30.	Dr. Md Nurus Safa	Deputy Director, Family Planning, Bandarban
31.	Md. Sohrab Hossain	Executive Engineer, DPHE, Bandarban
32.	Bivision Kanti Das	UNO, Matiranga, Khagrachhari
33.	Dr. Md Idris Mia	Civil Surgeon, Khagrachhari
34.	Md Shorab Hossain	Executive Engineer, DPHE, Rangamati
35.	Biplob Barua	Deputy Director, Family Planning, Khagrachhari
36.	Md. Nazrul Islam	Additional District Magistrate, Rangamati
37.	Dr. Md Mofijuddin Ahmed	Deputy Director, CS Office, Rangamati
38.	Begum Shahnewaj	Deputy Director, Family Planning, Rangamati
39.	Anupom Dey	Executive Engineer, DPHE, Rangamati
40.	Akhtarunnesa Sheuly	ADM, Feni
41.	Dr. Md.Niatuzzaman	Civil Surgeon, Feni
42.	Md Khalilur Rahman	Deputy Director, Family Planning, Feni
43.	Md Musleh Uddin	Executive Engineer, DPHE, Feni
44.	Md. Didarul Alam	UNO, Chatkhil, Noakhali
45.	Shafikur Ridwan Arman	UNO, Laxmipur, Sadar

46.	Dr. Shumon Barua	UHFPO, Teknaf, Cox's Bazar
47.	Dr. Abdul Mannan	UHFPO, Ukhia, Cox's Bazar
48.	Dr. Rezaul Hasan	UHFPO, Kutubdia, Cox's Bazar
49.	Dr. Misbahuddin Ahmed	UHFPO, Ramu, Cox's Bazar
50.	Dr. Md. Fajlul Karim	UHFPO, Shandip, Chattogram
51.	Dr. Abdul Mojib Osmani	UHFPO, Shitakundo, Chattogram
52.	Dr. Md. Shahidur Rahman	UHFPO, Alikadam, Bandarban
53.	Dr. Binod Shekhor Chakma	UHFPO, Rangamati Sadar
54.	Dr. Md Nurul Alam	UHFPO, Shonagazi, Feni
55.	Dr. ABM. MojammelHaq	UHFPO, Fulgazi, Feni
56.	Md. Rezaul Karim	Deputy Manager, BRAC
57.	Md. Shahjahan	Deputy Director, YPSA
58.	Md. Tajul Islam Khan	Additional Director, Ghasful
59.	Sk. Nazrul Islam	Divisional Operation Manager, Path Finder
60.	Md. Mansur	Sr. Correspondent, Baishakhi TV
61.	Billal Hossain	BTV
62.	Sharmin Shumi	Producer, BTV
63.	Imam Hossain Raju	Daily Purbakon
64.	Ibrahim Murad	Daily Purbakon
65.	Anupom Barua	Reporter, Daily Azadi
66.	Shihab Jisan	Jamuna TV
67.	Rokon Javed	Jamuna TV
68.	Bacchu Barua	The New Nation
69.	Ratan Barua	Daily Azadi
70.	Naimul Islam	Staff Reporter, Baishakhi TV
71.	Dr. Dewan Mashrur Hossain	Medical Officer, CCHPU

72.	Syed Istiak Ahmed	Office Manager, CCHPU
73.	Mehruba Sharmin	Research Associate, CCHPU
74.	Dr. Ishtiaq Mannan	Deputy Country Director, Save The Children Int.
75.	Muzammel Haque	Senior Officer, SCI
76.	Badrul Alam Talukder	Project Manager, CC, SCI
77.	Prof. Md Akram Hossain	Sr. Consultant (Microbiology), Imperial Hospital, Chottogram
78.	Prof Masud Ahmed	Sr. Consultant (ICU), Imperial Hospital, Chottogram
79.	Shahadat Hossain	Divisional Director (Health) Office, Chottogram
80.	Mohammad Hossain	Divisional Director (Health) Office, Chottogram

Participants List

Divisional workshop on “Climate- resilient comprehensive Health Adaptation Plan” at Sylhet, Bangladesh

Venue: Conference Room, Civil Surgeon Office		
Sl No	Name	Designation & Organization
1.	Mr Dipak Kanti Paul,	Additional Secretary and Managing Director, Bangladesh Climate Change Trust, Ministry of Environment, Forest and Climate Change.
2.	Tanvir Ahmed	Deputy secretary (PH-1), Health Services Division, MOHFW
3.	Md. Mokhtar Ahmad	Director (Planning, Development & Negotiation)&Secretary, BCCT, Ministry of Environment, Forest& Climate Change
4.	Prof Dr Md. Iqbal Kabir	Coordinator, Climate Change and Health Promotion Unit
5.	Shakila Yasmin	Assistant Director (Development), BCCT
6.	Dr. S. M Faridul Islam Latif	Principal and Deputy Director RTMI & HRDC
7.	Shamsul Gafur Mahmud	National Professional Officer (Water, Sanitation and Environment), WHO
8.	Dr. Dewan Mashrur Hossain	Medical Officer, CCHPU
9.	Syed Istiak Ahmed	Office Manager, CCHPU
10.	Mehruza Sharmin	Research Associate, CCHPU
11.	Mirza Faisal Husain	CCHPU
12.	Md. Mustafizur Rahman, PAA	Divisional Commissioner, Sylhet
13.	Md. Tahmidul Islam	Additional Divisional Commissioner, Sylhet
14.	Dr. Debapada Roy	Divisional Director (Health), Sylhet
15.	Brig. Gen. Md. Yunusur Rahman	Director, Sylhet MAG Osmani Medical College Hospital
16.	Md. Kutub Uddin	Divisional Director, Family Planning, Sylhet
17.	Saiful Islam	Senior Chemist, Environment Department, Sylhet
18.	Dr. Md. Anisur Rahman	Asst Director (Disease Control), DD Office, Sylhet
19.		Divisional Director (Disaster Management), Sylhet
20.	Ela Rani Deb	Asst Director (Nursing), DD Office, Sylhet
21.	Dr. Md. Shamim Hussain Chowdhury	Medical Officer- DD Office, Sylhet

22.		Asst Divisional Director, Family Planning, Sylhet
23.	Parvez Ahmed	Asst Divisional Director, Environment and Forest, Sylhet
24.		Asst Divisional Director, Disaster Management, Sylhet
25.	M Kazi Emdadul Islam	District Commissioner Sylhet
26.	Md. Abdul Ahad	District Commissioner Sunamgonj
27.	Mahmudul Kabir Murad	District Commissioner Habiganj
28.	Nazia Shirin	District Commissioner Moulavibazar
29.	Dr. Himangshu Lal Roy	Civil Surgeon, Sylhet
30.	Dr. Ashutush Das	Civil Surgeon, Sunamgonj
31.	Dr. A K M Mustafizur Rahman	Civil Surgeon, Habiganj
32.	Dr. Md Shahjahan Kabir Chowdhury	Civil Surgeon, Moulvibazar
33.	Dr. Md. Noor-e-Alam Shamim	Deputy Civil Surgeon, Sylhet
34.	Dr. Lutfunnahar Jesmin	Deputy Director, Family Planning, Sylhet
35.	Dr. Amzad Hossain Jitu	Mo-CS, Civil Surgeon office, Sylhet
36.		
37.	Mohammed Mozammel Haque	Deputy Director, Family Planning, Sunamganj
38.	Dr. Nasima Khanom	Deputy Director, Family Planning, Habiganj
39.	Md. Abdus Subhan	Deputy Director, Family Planning, Moulvibazar
40.	Engr. Md. Moshir Rahman Talukder	Executive Engineer, Department of Public Health Engineering, Sylhet.
41.	Engr. Md. Abul Kashem	Executive Engineer, Department of Public Health Engineering, Sunamganj.
42.	Engr. Md. Nurul Kabir Bhuiya	Executive Engineer, Department of Public Health Engineering, Habiganj.
43.	Engr. Sohrab Uddin Ahmed	Executive Engineer, Department of Public Health Engineering, Moulvibazar.
44.	Dr. Ahmed Hossain	UH&FPO, Barlekha, Maulvibazar
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51.	Dr. Abu Haider Mohammad Istiaque Mamun	UH&FPO, Madhabpur, Hobigonj

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57.	Dr. Saumitra Chakravarty	UH&FPO, Sunamganj Sadar
58.	Dr. Md. Iqbal Hussain	UH&FPO, Tahirpur, Sylhet
59.	Dr. S. M. Shahreer	UH&FPO, Balaganj, Sylhet
60.	Dr. Md. Shafikul Alam	UH&FPO, Fenchuganj, Sylhet
61.	Dr Md Rehan Uddin	UH&FPO, Gowainghat, Sylhet
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65.	Dr. Sukamal Roy	Divisional Quality Improvement Coordinator, Sylhet
66.	Kazi Humayun kobir	Shimantic, Sylhet
67.	Dr. Shahidul Alam	Technical Specialist. Ujjibon, Save the children
68.	Md. Jafurul Alam Prodhan	Divisional Manager, BRAC, Sylhet Division
69.	Ekramul Kabir	President, Sylhet Press Club
70.	Iqbal Mahmud	General Secretary, Sylhet Press Club
71.	Taposh Das Purkaystho	President, Sylhet District Press Club
72.	Shah Didar Alam Nobel	General Secretary, Sylhet District Press Club
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