



VOLUME 3

CLIMATE CHANGE ADAPTATION PLAN



KULHUDHUFFUSHI CITY, MALDIVES



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Project:

Disaster Management, Hazard Mitigation And
Climate Change Adaptation Plan

Client:

Kulhudhuffushi City Council

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I. CONTENTS

II. LIST OF ABBREVIATIONS	7
III. DEFINITIONS	8
01 EXECUTIVE SUMMARY	13
02 INTRODUCTION	18
03 KULHUDHUFFUSHI CITY & RISK PROFILE	20
CITY PROFILE	22
RISK PROFILE	24
04 CLIMATE CHANGE ADAPTATION	31
05 VISION	34
06 THEMES, STRATEGIES & ACTIONS	38
07 LOCALIZATION	77
08 IMPLEMENTATION PLAN	106
09 CONCLUSION	136
10 REFERENCES	138
11 APPENDICES	140



II. LIST OF ABBREVIATIONS

CCAP	Climate Change Adaptation Plan
CEOP	City Emergency Operation Plan
CRA	Climate Resilient Agriculture
DMP	Disaster Management Plan
DRR	Disaster Risk Reduction
EPZ	Environmental Protection Zone
FEMA	Federal Emergency Management Agency
FSI	Floor Space Index
GIS	Geographic Information Systems
HVCA	Hazard, Vulnerability and Capacity Assessment
KCC	Kulhudhuffushi City Council
LDP	Local Development Plan
LUP	Land Use Plan
MHPSS	Mental Health and Psychosocial support
MNDF	Maldives National Defense Force
MoU	Memorandum of Understanding
MRC	Maldivian Red Crescent
NDC	Nationally Determined Contribution
NDMA	National Disaster Management Authority
NGL	Natural Ground Level
NGO	Non-governmental organization
PWD	Person with a disability
R4R	Ready for Resilience
SDFC	SME Development Finance Corporation
SuDS	Sustainable Drainage Systems



III. DEFINITIONS

Adaptation

Adaptation refers to adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects.

It refers to changes in processes, practices and structures to moderate potential damages or to benefit from opportunities associated with climate change.

Building Code

A set of ordinances or regulations and associated standards intended to regulate aspects of the design, construction, materials, alteration and occupancy of structures which are necessary to ensure human safety and welfare, including resistance to collapse and damage.

Capacity

Physical, social, economic and institutional means as well as skilled personal or collective attributes such as leadership and management.

Climate Change

Climate change is “a change in the state of the climate that can be identified (eg: by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere on in land use.”

Climate Resilience

Climate resilience is the ability to adapt, recover, and thrive in response to climate challenges like extreme weather and rising sea levels, by reducing vulnerability and strengthening systems to withstand and bounce back from impacts.

Community Resilience

The ability of a community to cope with the effects of hazardous events through appropriate prevention, mitigation, preparedness, response and recovery mechanisms.

Critical Infrastructure

The physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society.

Disaster

A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic, and environmental losses and impacts.

Disaster Risk Reduction

The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broader context of sustainable development

Environmental Degradation

The reduction of the capacity of the environment to meet social and ecological objectives and needs.

Hazards

The hazards mentioned in this document are the hazards identified in the HVCA, which are relevant to the scope of CCAP.

Mitigation

Mitigation in climate change refers to actions aimed at reducing greenhouse gas emissions to limit global warming, such as using renewable energy, increasing efficiency, and protecting forests, with the goal of minimizing long-term climate impacts

Preparedness

Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations

Prevention

Activities to provide outright avoidance of the adverse impact of hazards and means to minimize related environmental, technological, and biological disasters.

Public Awareness

The extent of common knowledge about disaster risk, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards.



Recovery

Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.

Relief

Assistance and/or intervention during or after disaster to meet the life preservation and basic subsistence needs. It can be an emergency or protracted duration.

Response

Actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

Resilience

The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure.

Retrofitting

Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.

Risk

The probability of harmful consequences or expected losses (death, injury, property livelihood, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.

Sustainable Development

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Vulnerability

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.





Kulhudhuffushi City aerial imagery
Image credit: Charrette team

01

EXECUTIVE SUMMARY

Climate change presents a growing threat to Kulhudhuffushi City, as with the rest of Maldives. Facing rising sea levels, increasingly severe storms, and longer periods of extreme heat, Kulhudhuffushi City's vulnerability underscores the need for immediate action. The Climate Change Adaptation Plan (CCAP) provides a strategic plan for enhancing the city's resilience, protecting its people, and securing its economic and environmental future.

Kulhudhuffushi City contributes minimally to global greenhouse gas emissions, yet it bears the brunt of climate impacts due to its low elevation and dense urbanization. The city's geography and economy amplify its exposure to climate-related hazards, particularly flooding, coastal erosion, and extreme weather events. In response, the CCAP outlines a comprehensive approach to adaptation, focusing on sustainable urban planning, resilient infrastructure, economic diversification, and community empowerment. Developed in consultation with local stakeholders, the CCAP aligns with city development plans, Climate Emergency Act and other local and national level climate change adaptation policies and plans.

A Holistic Framework for Adaptation

The CCAP is structured around four interconnected themes: Governance, Planning, Economic & Finance, and Social. Together, these themes provide a robust framework for addressing climate-related challenges through both immediate actions and long-term strategies.

Governance underpins all adaptation efforts, establishing the policies and frameworks necessary to address the unique climate risks facing Kulhudhuffushi City. The plan advocates for climate-resilient regulations, local climate funds, and community-inclusive governance structures to

support sustainable decision-making. Improved **Planning** practices are also crucial. The CCAP emphasizes resilient infrastructure and sustainable urban design, integrating strategies like the Sponge City concept to reduce flood risks, manage stormwater, and restore natural coastal defenses, including mangroves and wetlands.

Economic development focuses on building a climate-resilient economy. Given the city's reliance on wholesale and retail trade, the CCAP encourages diversification into various sectors. By supporting green financing initiatives, encouraging renewable energy adoption, and promoting climate-resilient business practices, the plan aims to reduce economic vulnerability and foster sustainable growth. Furthermore, **Social** resilience is essential for community preparedness and engagement. The CCAP includes education, outreach, and capacity-building programs that equip residents with the skills and knowledge to respond effectively to climate hazards, particularly in vulnerable groups such as the elderly, children, and migrant workers.

In addition, we have identified areas within the CCAP that are cross-cutting or closely related to the Disaster Management Plan (DMP, 2025), the 'Tharahgee Plan'/ Local Development Plan (LDP, 2022-2026), and the Presidential Pledges (2023-2028). These connections ensure alignment and integration with broader development and resilience objectives.

Coordinated Action for Effective Implementation

Effective implementation of the CCAP requires strong collaboration among local authorities, community members, and national agencies. The plan outlines the importance of a coordinated response, in which stakeholders from various sectors work together to



integrate climate resilience into Kulhudhuffushi City's development goals. This approach ensures that policies, infrastructure projects, and economic activities align with both local needs and national adaptation priorities.

Key areas for collaboration include:

- **Policy Development:** City council, in coordination with national agencies, communities and relevant stakeholders will develop and enforce climate-resilient building codes, land-use guidelines, and urban development policies.
- **Data and Information Sharing:** Leveraging Geographic Information Systems (GIS) and other data and tools nationally and locally collected or developed will allow stakeholders to monitor environmental risks in real time, support informed decision-making, and enhance the overall effectiveness of climate adaptation efforts.
- **Community Engagement:** Involving local residents in adaptation planning—through workshops, training sessions, and public awareness campaigns—will foster a culture of resilience and ensure that community members are well-prepared for climate impacts.

Key Recommendations and Actions

The CCAP sets forth a range of actionable strategies designed to enhance Kulhudhuffushi City's resilience to climate change. Key recommendations include:

- **Systematic Collection of Data:** Systematic collection of data, led by the City Council, as a priority action to support evidence-based planning. Regular monitoring will strengthen the design and implementation of climate adaptation measures.

- **Developing Climate-Resilient Urban Policies:** Introducing new planning and development guidelines that mandate flood protection, promote vertical growth, and incorporate green infrastructure, such as green roofs and rainwater harvesting systems.

- **Adopting Sustainable Urban Design Concepts:** Implementing the Sponge City approach, which emphasizes the use of permeable surfaces and rain gardens to reduce surface runoff, manage storm water, and enhance natural flood protection.

- **Building Economic Resilience:** Supporting local businesses in adopting sustainable practices and providing green financing options to encourage the use of renewable energy technologies.

- **Empowering the Community:** Conducting workshops on climate change and disaster preparedness, integrating climate education into schools, and establishing outreach programs for vulnerable populations. The plan also recommends community-driven initiatives, such as neighborhood climate action projects and cultural heritage preservation, which strengthen social cohesion and promote collective resilience.

In conclusion, the CCAP for Kulhudhuffushi City is both a call to action and a plan for building a sustainable future. By implementing the strategies outlined in the CCAP, in line with its local development strategies, Kulhudhuffushi City can transform its vulnerabilities into strengths, creating a safer and more resilient city for its residents.

As per the vision statement, through a concerted effort, this Climate Change Adaptation Plan presents focused strategies, to create a city that strives to be greener, cooler, and comfortable for all. It emphasizes the need for proactive adaptation, collaborative governance, and community engagement, laying the groundwork for Kulhudhuffushi City to thrive in the face of climate change.



Project meetings held at Kulhudhuffushi City, 2024
Image credit: Charrette team



Kulhudhuffushi City during Covid, 2022
Image credit: Kulhudhuffushi Online



02

INTRODUCTION

This document presents the Climate Change Adaptation Plan (CCAP), for the main Disaster Management, Hazard Mitigation, and Climate Change Adaptation Plan for Kulhudhuffushi City. The CCAP is a comprehensive strategy designed to address and adapt to the impacts of climate change in the city. It utilizes hazards and gaps identified through the HVCA (2024), to outline both theoretical and practical strategies for climate adaptation at the local level. This focus on climate adaptation reflects the reality that, while Maldives and Kulhudhuffushi City contribute minimally to global emissions, the impacts of climate change significantly affect the region. It falls upon the community and stakeholders to take a proactive role in safeguarding their future. The participatory approach taken in developing this plan involved key stakeholders from different levels, ensuring that the developed strategies and actions are tailored to the unique context of Kulhudhuffushi City.

CCAP draws on diverse data sources, including surveys, stakeholder meetings, and relevant literature, to propose actions that enhance and strengthen the adaptability of the community. We have also reviewed the Disaster Management Plan (DMP, 2025), the 'Tharahgee Plan' / Local Development Plan (LDP, 2022-2026), and the Presidential Pledges (2023-2028) to align CCAP strategies and actions with those outlined in these documents.

The document is structured around four overarching themes, addressing the climatic hazards and issues relevant to the city. Under them comes ten comprehensive strategies, each further divided into specific actions and sub-actions (refer to Figure 1 on how the document is structured).

While some actions are broad in scope, ten actions have been localized to make the plan more accessible, adaptable, and actionable within the context of Kulhudhuffushi City. This includes case studies that examine how similar actions have been successfully implemented elsewhere, offering valuable lessons for Kulhudhuffushi City's adaptation efforts, how to develop the activities and actions needed, identifying the necessary technical and policy support, and outlines mechanisms for monitoring and evaluating the success of these actions.

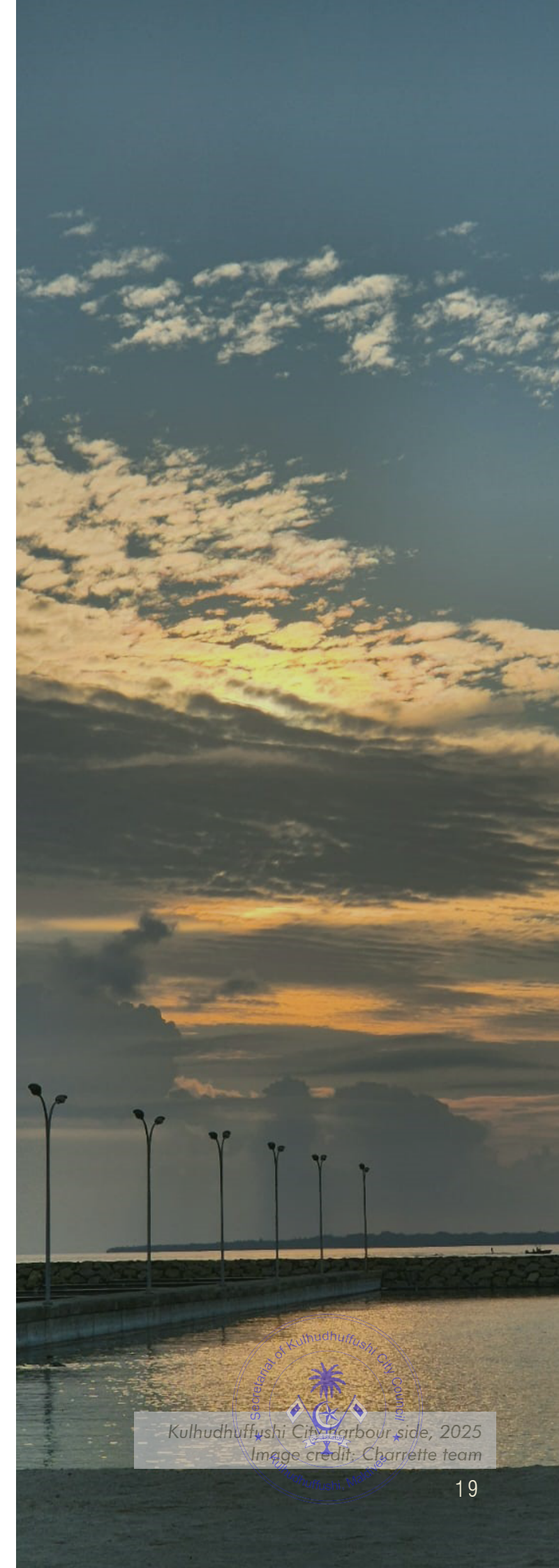
In summary, the CCAP provides a plan for adapting to climate-related hazards, either caused or intensified by global climate change. By integrating these strategies and prioritizing localized actions and human interventions into Kulhudhuffushi City's development and operational plans, and at an institution and citizen level, the city can proactively work toward improving the quality of life for its residents while achieving its vision 'Fini Fehi City'.

This plan is established for a duration of five years, after which it will undergo monitoring and necessary adjustments to ensure its continued relevance and effectiveness.

The supporting documents for this plan include the Hazard, Vulnerability, and Capacity Assessment (HVCA, 2024), Disaster Management Plan (DMP, 2025), City Emergency Operation Plan (CEOP, 2025), and the Implementation Plan.



Figure 1. How the document is structured



03

KULHUDHUFFUSHI CITY & RISK PROFILE

A brief summary of the city context and HVCA (2024) findings.

Kulhudhuffushi City's risk profile is shaped by its geographical location, climate, and socio-economic factors. This chapter details the city's specific vulnerabilities to climate change impacts, such as rising sea levels, rising temperatures and changing weather patterns. It also explores the socio-economic conditions that affect the city's ability to adapt, including infrastructure challenges and community readiness. By understanding these dynamics, the city can better prioritize resources and develop targeted strategies for enhancing resilience and adaptability.



CITY PROFILE

Kulhudhuffushi City, the northernmost city in the Maldives, serves as the administrative capital of South Thiladhunmathi (H.Dh) Atoll. With both an airport and a seaport, the city is the Northern hub for regional connectivity. Its economy primarily revolves around wholesale/retail commercial activities. The public sector plays a dominant role in employment, as the largest contributor of job opportunities.

Island Morphology

Kulhudhuffushi City's landscape has undergone dramatic changes over the decades. Historical imagery from the 1970s shows a verdant island rich in vegetation, with extensive wetlands that supported the island's biodiversity and ecological balance. However, by the 2010s, extensive land reclamation had reduced the size of these wetlands, and urban sprawl had spread across the island. One of the most significant changes was the development of the airport, which improved the accessibility to the city but also reshaped land use patterns. These developments illustrate the ongoing interaction between human activities and environmental preservation, documenting the island's transformation over time.

Climate and Environment

Kulhudhuffushi experiences two distinct seasons: a wet season and a dry season. The city's mean temperature ranges from 28.1°C to 28.7°C, with maximum temperatures between 30.9°C and 31.8°C, and minimums ranging from 24.5°C to 25.3°C. While year-to-year fluctuations exist, no consistent trend of rising or falling temperatures has been observed in the past 20 years. The city experiences high humidity year-round, which further intensifies the heat felt by residents.

The island's average elevation is 1.41 meters above mean sea level (MSL), with lower areas to the north and south, and the highest points located in the mid-island region. Rainfall patterns indicate substantial water accumulation during heavy rainfall. A high-resolution Digital Elevation Model of the island shows flood-prone areas, particularly in low-elevation zones historically occupied by wetlands and mangroves. Development, including reclaimed land on the western side of the island, has increased the risk of water pooling in depressions, making these areas more susceptible to flooding.

Air quality in Kulhudhuffushi is impacted by the Northeast monsoon season, during which particulate matter is carried from the main continent, resulting in haze. This poses health risks to the local population, who are exposed to elevated levels of air pollution during this period.

Demographic Characteristics

Kulhudhuffushi City's population has grown to 10,131, with a 1.6% increase from 2014 to 2022 as per the 2022 Census. This includes a growing presence of foreign workers, of whom 90% are men.

The demographic landscape of Kulhudhuffushi City highlights several vulnerable groups that are prominent. These groups often face barriers to decision-making, as well as challenges related to accessibility, employment, and social inclusion.

According to the data collected from a household survey done with the HVCA under this project (Charrette Studio, 2024), individuals with disabilities constitute 16% of the population, with 235 persons registered as such in the disability register, while drug users represent 3%. Migrant workers account for 10% of the

population, the elderly comprise 19% and displaced individuals make up 5% of the population. The elderly, in particular, face challenges related to health and mobility, while children, women and migrant workers are more vulnerable to exploitation and violence during crises.

Moreover, poverty affects a significant portion of the population with 33% living below the poverty line. Low-income families and those with limited education have fewer resources and understanding to prepare for and recover from disasters. Housing conditions further exacerbate these vulnerabilities, as poorly constructed homes are more susceptible to damage from floods, storms, and other hazards. Other vulnerable groups constituting 3% of the population face specific challenges that require targeted interventions to address their multifaceted vulnerabilities.

The city has limited access to mental health care and other psychosocial support services, compounding the vulnerability of those already at risk. Addressing these vulnerabilities calls for inclusive, equitable strategies that prioritize resilience and social justice.

Economic Impact of Disasters

Kulhudhuffushi's economy has shifted considerably from a predominantly primary economic sector to several sections falling under the wholesale, retail and transport sectors. These changes were made possible largely by the regional airport and the establishment of the sea transportation network which significantly caused the rise in retail and wholesale over recent years. Additionally, the economy heavily relies on a steady supply of goods to the nearby atolls and islands, particularly within the Haa Alif and Haa Dhaalu atolls.

The heavy dependence on wholesale and retail trade makes the economy highly vulnerable to natural hazards such as tsunamis and storm surges. For instance during bad weather, the sea transportation is halted which directly impacts the economic activities in the city.

Financial institutions and state-owned enterprises provide additional economic stability. However, economic resilience remains dependent on the city's ability to protect these enterprises from disaster impacts, particularly in flood-prone areas. Currently, key infrastructure, including the local airport, regional port, and water treatment plants, are located along the coast, making them particularly vulnerable to flooding and storm damage.

In the event of a disaster, economic losses are expected to be substantial, impacting both infrastructure and business operations.

Commitment to Resilience

Kulhudhuffushi City is the first Maldivian city to join the United Nations Office for Disaster Risk Reduction's (UNDRR) Making Cities Resilient (MCR) initiative. This demonstrates the city's proactive approach to building resilience, addressing environmental challenges, and preparing for the impacts of climate change and urbanization.

Additionally, the community is supported by MRC, NGO's and social groups that help with awareness, information dissemination on different issues that impact the community.



RISK PROFILE

Impacts of climate change

Kulhudhuffushi City faces various natural and man-made hazards due to its geographical location, climate and socioeconomic factors. In this section we will look at the climate related hazards and its impacts on city.



Rainwater Flooding

Historically, Kulhudhuffushi City's open courtyards, coral limestone walls, and unpaved dirt roads helped manage rainwater drainage. However, recent urban development has replaced these traditional systems with concrete structures and compacted roads, reducing water infiltration and increasing runoff to streets. Heavy rainfall events, which have occurred sporadically in recent years, now lead to periodic flooding due to inadequate drainage infrastructure and insufficient monitoring of water management regulations.



Heatwave (later referred by NDMA as 'extreme heat')

Rapid urbanization and the loss of green spaces have increased the island's surface area and built environment percentage, raising urban temperatures. Heat waves, inevitable in equatorial zones, when combined with seasonal monsoon changes and global climate change, can severely impact the resident population. Local modifications, such as added reflective surfaces and the removal of greenery, further contribute to the island's heat island effect, worsening the impact on residents.



Storm Surge

Kulhudhuffushi City, located on the eastern rim of the Maldives, faces significant risk from storm surges originating from the East Indian Ocean. Studies such as DIRAM (2007) have identified storm surges as a major hazard, with estimates showing surges reaching heights of 1.32 meters (UNDP, 2006).



Tropical Storm

Kulhudhuffushi City's built environment is highly vulnerable to tropical storms due to several factors. Tall structures with large vertical surfaces increase the area exposed to heavy rains, while concrete surfaces and courtyards reduce water infiltration. The lack of natural windbreaks like trees, which have been cleared over time, worsens the storm's impact, as winds and rain hit the island with greater force. The infrastructure is not designed to withstand such events, and without adequate storm-resistant planning or natural barriers, the island faces high risks during tropical storms.



Loss of Mangroves/ Wetlands

In Maldives, mangroves are often removed first for infrastructure projects, and Kulhudhuffushi City is no exception. The mangrove areas have been significantly reduced, with one area now serving as a waste deposit and the construction of the airport

taking over additional mangrove and wetland spaces. Remaining mangroves on the northern side are fragmented into three sections due to airport development, impacting their ecological function. The ongoing ring road project tied with the cable project in the eastern woodland exacerbates the edge effect, threatening its biodiversity. Additionally, erosion caused by rainwater flooding is leading to sediment accumulation in the remaining mangrove areas, which may transform them into wetlands.



Coastal Erosion

The island footprint has expanded significantly over the years, particularly with major reclamation on the western side, supported by a quay wall. The northern mangrove shoreline has been reclaimed for the airport project, while shore protection measures have been implemented on parts of the northeastern and southeastern sides. Despite these efforts, there is evidence of severe erosion on the artificial beach along the southwestern and eastern sides, with the latter having a very high berm. Erosion threatens the only available natural woodland and built infrastructure. The shore protection for the airport development has resulted in placement loss erosion along the eastern shoreline, where the northern half contains sediment with smaller grain size, while the eastern side features sediment with larger grain size. This difference leads to steeper berms and positions the toe of the beach closer to the berm, making the area more susceptible to wave action.



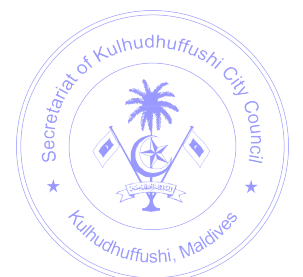
Water-borne Diseases

Waterborne diseases have historically posed a significant threat to the island's residents, with notable incidents such as cholera outbreaks in the 1970s resulting in substantial loss of life. Although exposure levels have decreased due to alternative water sources like reverse osmosis (RO) by MWSC and integrated harvesting, the risk remains. Should these water harvesting methods fail, the islanders could face similar threats again. Not all locals have carried out the process, leading some to rely on groundwater, which is susceptible to salt intrusion, leachate from legacy waste, and contamination from numerous open wells.



Cyclone

Cyclones have been recorded in the island's historical profile, with the 'loss of Keylakunu' believed to have been caused by a cyclone. The island's built environment offers limited protection against the impact of cyclones. Additionally, the built infrastructure has reduced the island's drainage capacity, which can exacerbate surface water flooding, increasing the potential damage caused by cyclone-related flooding.



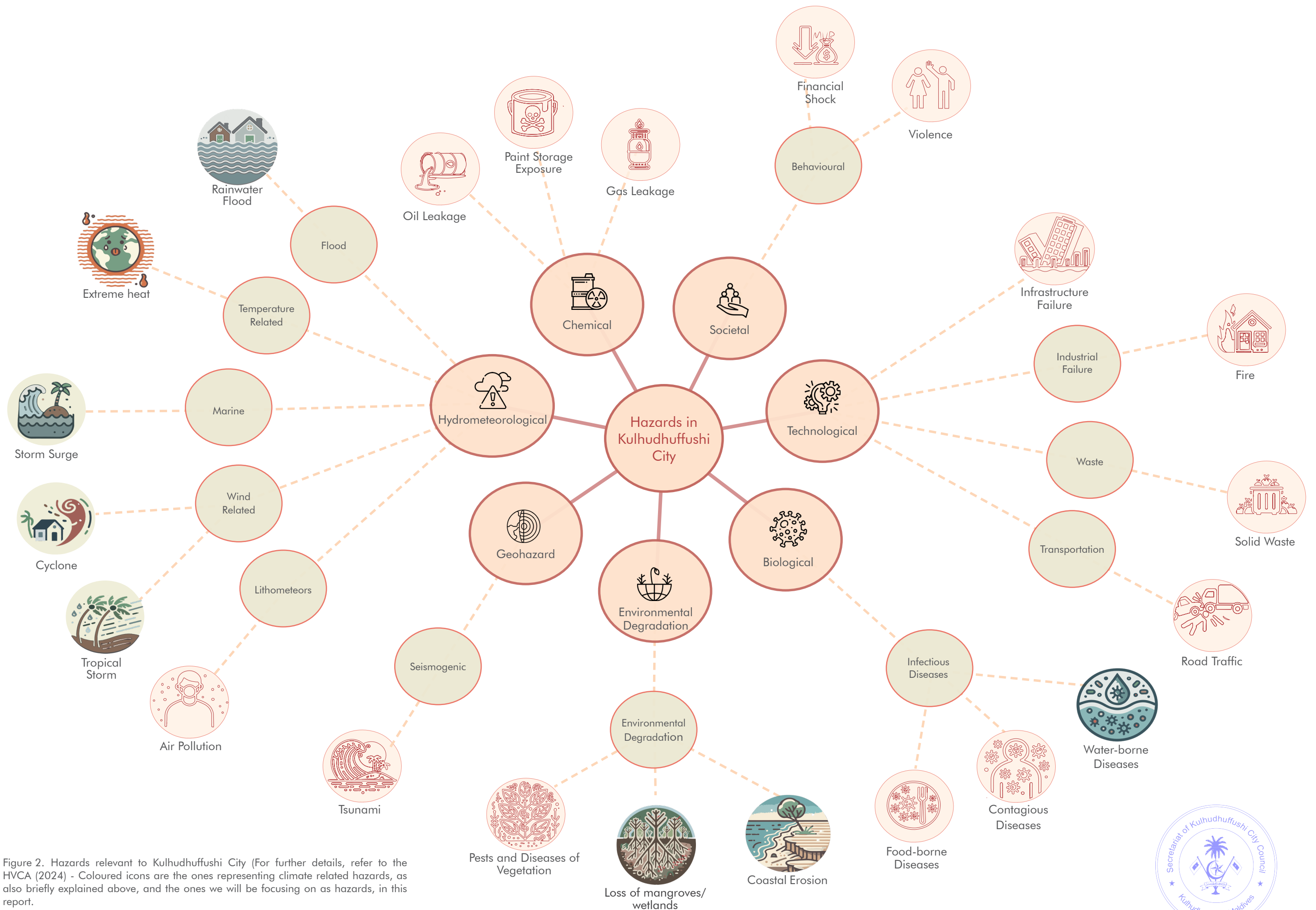


Figure 2. Hazards relevant to Kulhudhuffushi City (For further details, refer to the HVCA (2024) - Coloured icons are the ones representing climate related hazards, as also briefly explained above, and the ones we will be focusing on as hazards, in this report.

Risk

Risk Assessment Process

The four main steps involved in the risk assessment process are:

1. Understanding the context: understanding the natural climate, geography and topography, demographics, economy, and community infrastructure
2. Analysing hazards: identifying the relevant hazards through analysis of historical data and public consultations
3. Assessing risk: using disaster risk assessment tools to assess the likelihood and severity of the hazards and identify the biggest risks.
4. Risk-based planning: identifying mitigation, prevention, and preparedness activities to minimise the impact of the risk.

Risk Assessment of Kulhudhuffushi City

Severity reflects the potential impact of a hazard, while likelihood evaluates the probability of its occurrence. Together, these factors offer a comprehensive assessment of risk (see Figure 3). Hazards with both high severity and likelihood present elevated risks, demanding prompt attention and robust risk management strategies. Conversely, even hazards with low severity and likelihood warrant consideration, as their cumulative or combined effects may heighten the city's overall risk profile.

Having recognized the climate-related hazards from the overall risk assessment, as illustrated in Figure 3, the following chapters will explore the proactive strategies Kulhudhuffushi City shall implement to address these challenges.

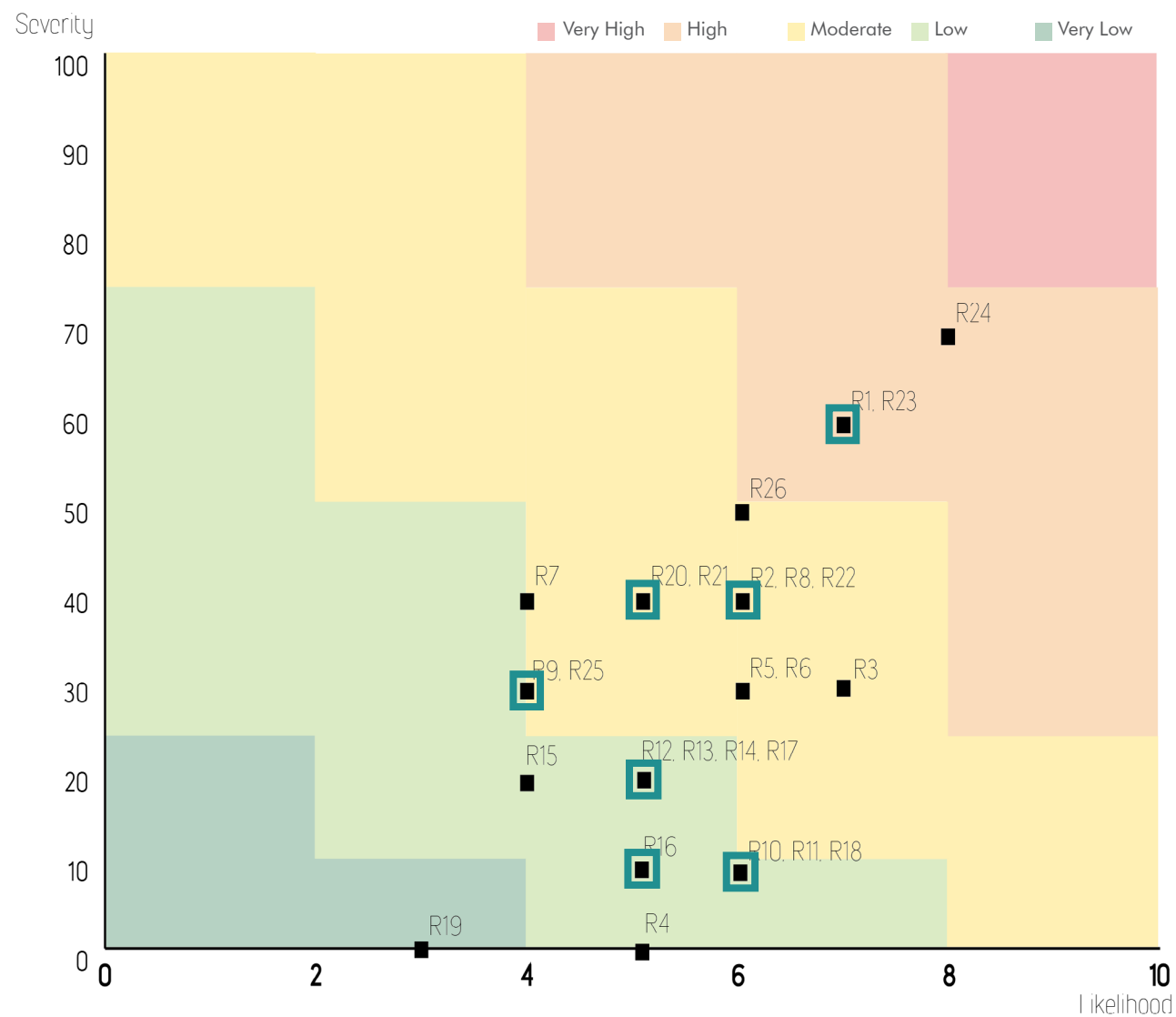


Figure 3. Severity vs Likelihood Risk Graph, with climate related hazards marked in teal

Climate Change Adaptation Cycle

Adaptation is a continuous process involving the assessment of risks, planning, implementation, evaluation, and adjustment. It is essential to take proactive steps in building resilience to natural hazards and other climate impacts while shaping our responses in a holistic manner. Climate-related risks over longer timeframes are inherently uncertain, requiring us to remain flexible and ready to adapt as new information and understanding emerge. Figure 4 shows how these aspects can interplay in the climate change adaptation process of a city.

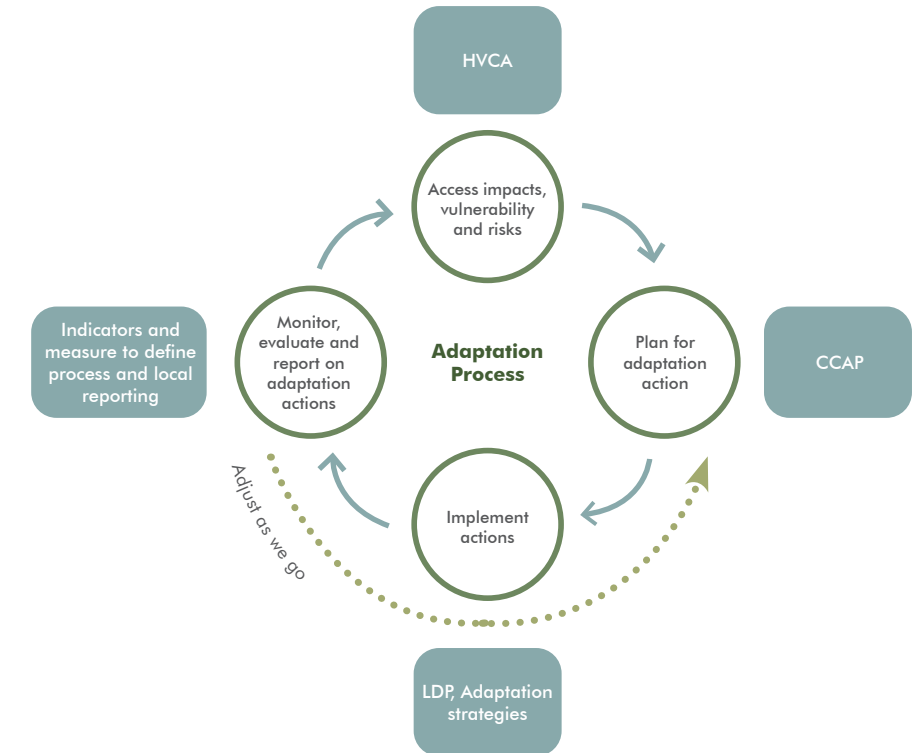


Figure 4. Climate Change Adaptation Cycle

R01	Extreme heat
R02	Surface-water Flooding
R03	Tsunami
R04	Air Pollution
R05	Traffic Accidents
R06	Assault
R07	Solid Waste
R08	Sexual Offences
R09	Infrastructure Failure
R10	Economic Inequalities
R11	Contagious Diseases
R12	Drugs
R13	Theft
R14	Domestic Violence
R15	Fire
R16	Storm Surge
R17	Waterborne Diseases
R18	Coastal Erosion
R19	Food-borne Diseases
R20	Cyclone
R21	Tropical Storm
R22	Oil Leakage
R23	Paint Storage Exposure
R24	Gas Leakage
R25	Loss of Mangrove
R26	Pests & Disease of vegetation



04

CLIMATE CHANGE ADAPTATION

Climate change is one of the most pressing challenges, driven by rising greenhouse gas emissions from human activities like burning fossil fuels and deforestation. It is causing higher global temperatures, more frequent extreme weather events, sea-level rise, and disruptions to ecosystems. These impacts threaten food security, water resources, and the livelihoods of millions of people worldwide.

At international forums such as the Paris Agreement, countries have pledged to limit global warming to 1.5°C above pre-industrial levels by reducing carbon emissions, transitioning to renewable energy, and enhancing resilience. Despite these promises, current global efforts fall short of meeting these targets, with emissions continuing to rise in many regions, putting vulnerable small island developing states like the Maldives at severe risk.

As a low-lying island nation with its highest natural point just 2.4 meters above sea level, the Maldives is extremely vulnerable to the impacts of climate change. Sea-level

rise threatens to inundate large parts of the country, while extreme weather events such as intense storms, flooding, and rough seas are becoming more frequent and severe. Urban heat island effects are increasing, and flooding from both rain and storm surges is putting infrastructure, freshwater resources, and coastal communities at serious risk.

The Climate Emergency Act (Act no. 9/2021) of Maldives underscores the urgency for immediate climate action, highlighting the need for both mitigation and adaptation strategies. The Maldives' First Nationally Determined Contribution (NDC), updated in 2020, sets ambitious targets. The 2020 NDC update mentions a strengthened emission reduction target and signals a net-zero target by 2030 and both commitments are fully conditional to international support. Economy-wide 2030 target to reduce emissions by 10% unconditionally and by 24% conditionally. It also emphasizes the crucial need for adaptation.

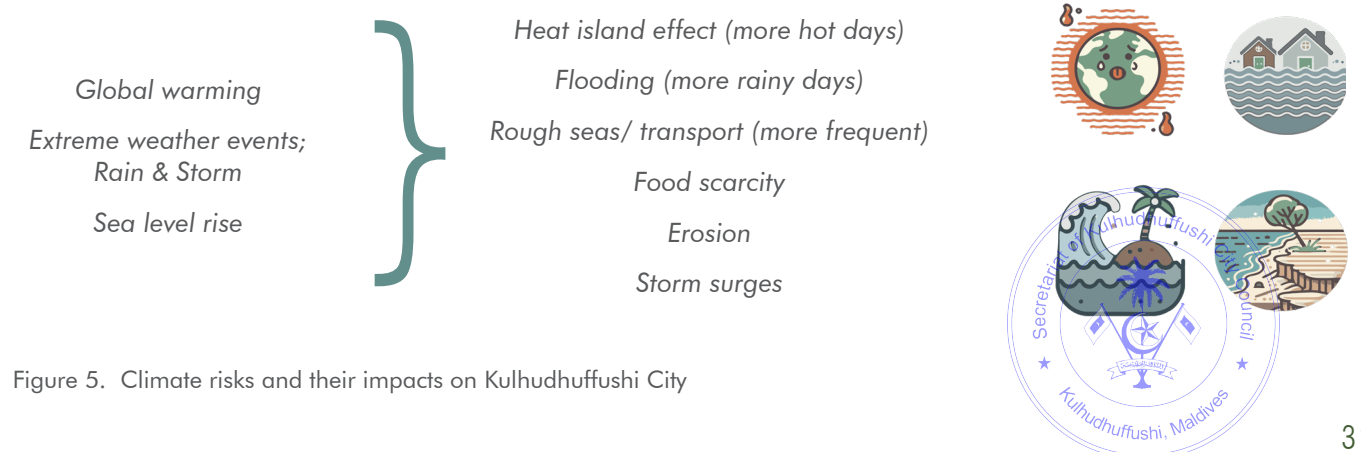


Figure 5. Climate risks and their impacts on Kulhudhuffushi City

While having these targets and achieving these targets are essential, adaptation—adjusting systems and infrastructure to cope with climate impacts—is more critical for the Maldives than mitigation. In islands like Kulhudhuffushi City, sea-level rise could lead to frequent flooding of homes and businesses, while urban heat islands will increase temperatures, affecting livelihoods and public health (as illustrated in Figure 5). The island is also vulnerable to rough seas, which threaten coastal erosion and disrupt fishing and transport of goods and people from other islands (Figure 6).

While the Climate Emergency Act and NDC are crucial steps toward building resilience, sustained local efforts and global support are vital for protecting islands like Kulhudhuffushi City from the growing threats of climate change.

This CCAP aims to address these challenges localizing its strategies and actions to the Kulhudhuffushi City based on island specific vulnerability assessments (HVCA, 2024) carried out as part of this initiative.



Figure 6. Extreme weather events at Northern area of Maldives and Kulhudhuffushi City



A road leading to a beach side of Kulhudhuffushi City
Image credit: Charrette team



05

VISION

The vision outlines the long-term goals and aspirations for Kulhudhuffushi City in its journey toward climate adaptation. Development of a vision in a CCAP is crucial because it is to be used to align all strategies and actions with a shared future outcome. This vision is to function as a target, helping stakeholders focus their efforts on building a climate-adaptive city.

‘ Fini Fehi City ’

As Kulhudhuffushi City continues to develop, residents have expressed growing concerns about rising temperatures. Additionally, the loss of greenery and recurring flooding have further impacted their daily lives.

Through a concerted effort, this Climate Change Adaptation Plan presents focused strategies, to create a city that strives to be greener, cooler, and comfortable for all.

Hence the vision statement for the city intends to capture this, using keys words from our mother tongue, “Fini” meaning cool, and “Fehi” meaning green.





Kulhudhuffushi Ci't's airport
Image credit: MRC team



06

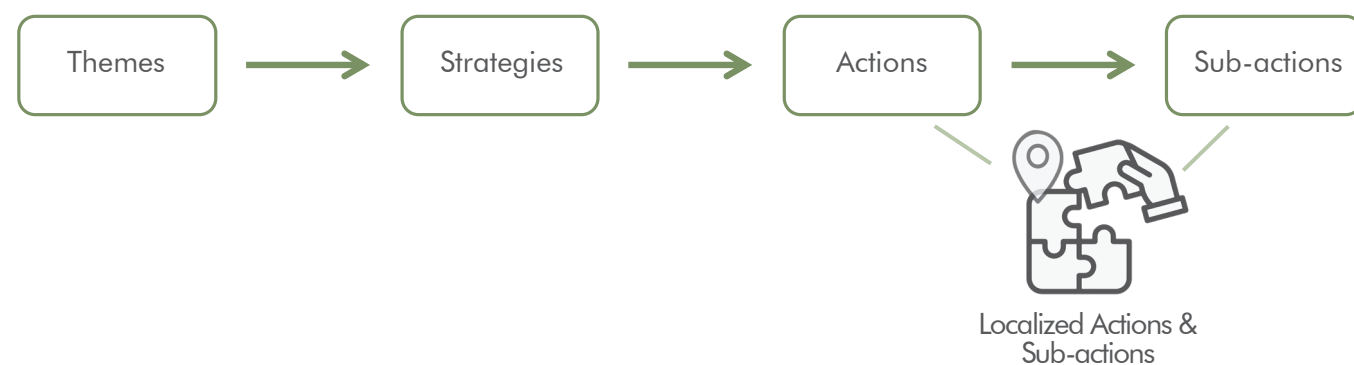
THEMES, STRATEGIES & ACTIONS

To address the hazards, risks, and issues identified and to successfully realize the city's vision, this CCAP outlines ten distinct strategies organized under four key themes: 'Governance', 'Planning', 'Economic & Finance', and 'Social'. These themes serve as the pillars for Kulhudhuffushi City's approach to climate change adaptation. Under these themes, ten comprehensive strategies were developed.

These strategies encompass a broad array of measures designed to work towards climate change adaptation for Kulhudhuffushi City. They include efforts in data collection, resource security, securing financial resources, community empowerment, and improving health and well-being, among others. Each overarching strategy is further supported by detailed actions and sub-actions, designed to target specific challenges and issues.

This chapter begins by briefly introducing the four themes: 'Governance,' 'Planning,' 'Economic and Finance,' and 'Social.' This is followed by a summary of all ten strategies. At the end, it provides a detailed breakdown of all the actions and sub-actions under the aforementioned themes and strategies (Figure 1).

All icons introduced here will be used throughout the report to reference the corresponding theme or strategy. Localized actions have the below icon enclosed in a circle, near the action heading. Proposed CCAP actions and sub-actions that crosscut with the actions included in the DMP (2025), and strategies in the LDP (2022 - 2026) will be noted under the CCAP action or sub-action explanatory text, with reference to the DMP (2025) or LDP (2022 - 2026) action/ strategy number in square brackets. Any action that aligns with the presidential pledges have also been noted and referenced in the footnote.



Chapter 02: Introduction - Figure 1. How the document is structured



Theme 1 - Governance

This theme emphasizes the importance of strong governance to ensure climate resilience and sustainable development. It focuses on integrating climate considerations into policies and urban planning, ensuring that development is aligned with environmental sustainability and avoids vulnerable areas. Effective resource management and collaboration with various stakeholders, including international partners and research institutions, are also essential. This theme also focuses on informed decision-making through up-to-date local data collection and analysis. By promoting strategic partnerships and a cohesive approach, governance ensures that climate action is well-coordinated and capable of addressing long-term challenges.



Theme 2 - Planning

Planning theme encompasses strategies and actions that promote informed, forward-thinking decision-making, such as promoting and integrating climate-resilient infrastructure into urban development. Sustainable urban planning addresses the need to adapt critical infrastructure, spaces for water management, review and update of plans and preservation of green buffers. Additionally, it includes infrastructure being designed to withstand environmental stresses while promoting eco-friendly practices. The theme also focuses on food, water, and energy security through planning initiatives that enhance self-sufficiency, resource management, and climate adaptation.



Theme 3 - Economic & Finance

This theme focuses on securing long-term financial stability and resilience in the face of climate change. It aims to foster sustainable economic growth by supporting local communities, especially vulnerable groups, in developing alternative livelihoods that can withstand environmental challenges. A core aspect of this theme is the promotion of green financing initiatives, which encourage households and businesses to adopt eco-friendly practices. Additionally, targeted programs such as micro-grants empower communities to lead climate adaptation projects, while strategic investments in small businesses help them build resilience and thrive despite climate risks.



Theme 4 - Social

The Social theme focuses on strengthening community resilience and well-being in response to climate challenges. It prioritizes empowering communities through educational initiatives, training programs, and workshops that build social bonds and enhance collective preparedness. Special attention is given to vulnerable groups, ensuring they are equipped with the knowledge and skills to navigate emergencies and adapt to changing environmental conditions. Additionally, this theme addresses the physical and mental health impacts of climate change by improving access to mental health support, preparing healthcare systems for climate-sensitive risks, and ensuring outreach during extreme weather events..



Theme 1
GOVERNANCE



STRATEGY 1

Develop Climate Resilient Policies and Plans

This strategy focuses on ensuring that the policies, regulations, and guidelines governing urban planning and development in Kulhudhuffushi City are designed to address the challenges posed by climate change. It aims to promote sustainable practices and integrate climate resilience into all facets of urban development and design while also addressing social inequalities through inclusive policies.



STRATEGY 2

Resource Management & Consensus Building

This strategy emphasizes the establishment of a climate fund within the council's budget to prioritize and finance climate adaptation and mitigation efforts. It also promotes collaboration with relevant authorities and stakeholders, such as waste management service providers, to ensure effective and safe management of medical waste. By partnering with these entities, Kulhudhuffushi City can ensure that critical services remain resilient during extreme weather events, contributing to the overall community's health and well-being.



STRATEGY 3

Up-to-Date Information Collection and Dissemination

Accurate and timely information is crucial for effective climate change adaptation and decision-making. This strategy focuses on establishing a robust information collection and dissemination framework that leverages modern technology to support climate resilience initiatives in Kulhudhuffushi City.



STRATEGY 4

Sustainable urban planning

This strategy aims to integrate and preserve green and open spaces, ensuring that urban development in Kulhudhuffushi City aligns with sustainability. Plans include rejuvenating the green buffer (heylihifah) around the island, adopting the Sponge City concept to manage storm water more effectively, and actions to address urban heat island effect, while making the city cooler through green spaces. A strong framework for preserving mangroves and wetlands, and revision of plans is incorporated, along with enhancing waste management systems, to support a resilient urban environment.

Theme 2
PLANNING



STRATEGY 5

Resilient infrastructure

This strategy focuses on strengthening Kulhudhuffushi City's infrastructure to withstand the growing threats of climate change. By integrating sustainable design practices, the aim is to reduce vulnerabilities in critical areas, improve disaster preparedness, and promote eco-friendly alternatives. Through adaptive building measures, the development of resilient coastal solutions, some actions specifically targeting critical infrastructures, and the promotion of green transportation options, this strategy seeks to create an environment that is both safer and more sustainable for the community.



STRATEGY 6

Food, Water and Energy Security

Ensuring the security of essential resources such as food, water, and energy is crucial for the resilience of Kulhudhuffushi City, particularly in the face of climate change. This strategy focuses on building robust systems to manage disruptions, improve self-sufficiency, and promote sustainable practices.



Theme 3
ECONOMIC & FINANCE



STRATEGY 7

Economic development to fight against climate change

As climate change continues to threaten local livelihoods and economies, Kulhudhuffushi City must proactively develop resilient economic models that can help communities adapt to environmental challenges while ensuring sustainable growth. The following actions aim to diversify income sources, foster sustainable tourism, and support businesses in building resilience against climate risks.



STRATEGY 8

Climate financing

Securing adequate funding for climate adaptation and mitigation initiatives is crucial for Kulhudhuffushi City's resilience against climate change. This strategy outlines actionable steps to create dedicated financial resources, support green financing for households and businesses, and provide micro-grants for community resilience projects.

Theme 4
SOCIAL



STRATEGY 9

Community Empowerment

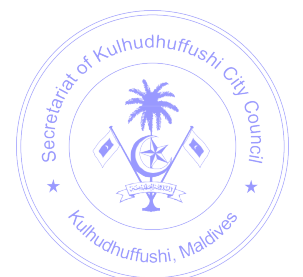
A vital component of climate change adaptation is the empowerment of local communities, ensuring that they are actively involved in shaping the strategies and actions that directly impact their lives. This strategy emphasizes fostering social cohesion, resilience, and a sense of shared responsibility through community-driven events and workshops, including culturally significant celebrations and activities. By harnessing the knowledge and leadership of key stakeholders, and engaging with local NGOs, city should aim to build capacity for effective disaster preparedness and climate resilience. Monitoring and training was included for sustainability of the proposed actions.



STRATEGY 10

Ensuring Health & Well-being in the face of climate risk

The increasing frequency and intensity of extreme weather events pose significant risks to public health and well-being. Vulnerable populations such as the elderly, PWDs, and pregnant women are particularly susceptible to the impacts of climate-related events. This strategy focuses on safeguarding the physical and mental health of all residents in Kulhudhuffushi City, ensuring that medical systems are equipped to handle climate-sensitive health risks, and promoting overall resilience.





Ecosystem restoration work, aimed at revitalizing coastal vegetation and preserving the magnificent mangroves, carried out by the Maldivian Red Crescent in Kulhudhuffushi City
Image credit: Maldivian Red Crescent (MRC)





Strategy 1: Develop Climate Resilient Policies and Plans



Action 1.1: Introduce Planning and Development Guidelines to Ensure Green and Sustainable Design and Development Practices



This action aims to establish guidelines that promote eco-friendly, energy-efficient, and climate-resilient urban development. It focuses on limiting buildable areas, incorporating green spaces, elevating structures in flood-prone zones, and ensuring sustainable construction to reduce climate risks and support long-term resilience. This action also links to Action 5.2 of this plan.

[DMP 2025: 1.2.2, 1.4.1, 1.4.4, 1.5.2]
[LDP 2022-2026: Strategy 20.1]

Sub-action 1.1.1:

Approve and Publish Climate-Resilient Land Use and Development Guidelines

The New Land Use Plan (LUP) will integrate climate-resilient design principles to ensure sustainable urban development. It will define buildable areas by limiting the buildable portion of each plot to a maximum of 80%, allocating 10–15% for open and green spaces to mitigate environmental risks such as urban heat island effects. Additionally, the guidelines will establish clear parameters for setbacks, ventilation, and energy-efficient building design, enhancing livability and sustainability. A Floor Space Index (FSI) of 4–5 will be introduced to encourage vertical development, optimizing land use while maintaining essential open spaces for community well-being.

Sub-action 1.1.2:

Ensure new developments incorporate flood

protection measures and adhere to elevation guidelines.

New developments will only be approved if they comply with the flood protection guidelines under the new LUP. These developments must integrate safeguards such as elevated structures or flood barriers to minimize water damage risks in vulnerable zones. Additionally, planning and development guidelines will be developed and published to set minimum height requirements for the lowest finish level (plinth level) of buildings, ensuring resilience against flooding.

Sub-action 1.1.3:

Include a Clause Requiring Critical Buildings to Be Elevated 350mm–550mm, from NGL.

Critical infrastructure, such as hospitals, schools, and emergency services, will be required to elevate the lowest occupied levels of their buildings 350mm–550mm above NGL. This will increase their resilience against flooding.

Sub-action 1.1.4:

Ensure All New Buildings in Flood-Prone Zones Are Elevated by 350mm–550mm, from NGL.

New developments in flood-prone areas must be elevated between 350mm and 550mm to minimize the risk of water damage and ensure the long-term viability of structures in the face of climate change.

Sub-action 1.1.5:

Zoning flood-prone areas directly in LUP.

Under the new LUP, flood prone areas can be declared and zoned to dictate what types of developments are allowed, with accompanying planning guidelines.

Action 1.2: Integrate Climate Resilience into Existing Policies and Regulations

Existing urban development policies and regulations will be reviewed and revised to incorporate climate-

resilient measures, such as flood protection, storm water management, and energy-efficient design. This will ensure that future developments are aligned with sustainability goals.

[DMP 2025: 1.2.2]

Sub-action 1.2.1:

Review and revise all the existing policies, regulations and plans within the jurisdiction to incorporate climate resilient measures, as proposed in Actions 1.1, 4.1, 4.3, 5.2, 5.4, 5.5, 5.7, 6.2 of this plan.

Action 1.3: Promote Inclusive Policies that Address Gender and Social Inequalities

Climate resilience policies will be drafted with a focus on inclusivity, ensuring that gender and social inequalities are addressed. This will help reduce the disproportionate impact of climate change on vulnerable groups.

[DMP 2025: 2.4.3]
[LDP 2022-2026: Strategy 48.1, 53.1, 53.4]

Sub-action 1.3.1:

Conduct Gender and Social Impact Assessments for Inclusion of Climate Resilience in Projects

Before implementation of projects, ensure gender and social impact assessments are carried out. These assessments will provide insight into how different groups will be affected, allowing for tailored interventions that reduce inequality.

Sub-action 1.3.2:

Ensure Plans and Policies Address Gender and Social Inequalities

All new policies and plans will undergo a review process to ensure they address the unique challenges faced by marginalized groups, ensuring equitable development outcomes as part of the overall climate resilience strategy.

Action 1.4: Create a Strong Framework for Preserving Existing Mangroves and Wetlands

Mangroves and wetlands are vital for coastal protection and biodiversity. A robust preservation framework will help mitigate erosion, protect habitats, and enhance resilience against sea-level rise.

[DMP 2025: 1.2.2, 1.10.1]

Sub-action 1.4.1:

Conduct assessments to identify priority areas for mangrove and wetland conservation.

Regular assessments help identify critical mangrove and wetland areas in need of protection, ensuring long-term conservation efforts are focused where they're most needed.

Sub-action 1.4.2:

Develop tailored management plans for long-term sustainability.

Tailored management plans ensure the sustainability of specific mangrove and wetland ecosystems by addressing unique environmental challenges and preservation needs.

Sub-action 1.4.3:

Organize community mangrove restoration projects and reforest degraded areas with native species.

Community-driven projects that restore mangroves contribute to coastal protection and biodiversity conservation, while engaging locals in environmental stewardship.¹





Strategy 2: Resource Management & Consensus Building



Action 2.1: Allocate a Climate Fund Within the Council Budget

Establishing a climate fund is vital for enabling the council to prioritize and finance climate adaptation and mitigation efforts. By integrating climate financing into the council's budget, Kulhudhuffushi City can demonstrate its commitment to addressing climate challenges effectively.

[DMP 2025: 1.2.4]

Sub-action 2.1.1:

Conduct a needs assessment to determine priority areas for climate adaptation and mitigation projects that require funding. This assessment will help identify the most pressing climate risks and the necessary interventions to enhance community resilience.

Sub-action 2.1.2:

Develop a detailed budget proposal outlining short-term and long-term climate goals along with associated costs. This proposal will serve as a roadmap for allocating resources and securing funding.

Sub-action 2.1.3:

Set up a dedicated climate fund within the council's financial structure to ensure transparent tracking and reporting of climate-related expenditures. This fund will facilitate accountability and make it easier to assess the impact of investments on climate resilience.

Action 2.2: Collaboration with Other Countries, Universities, and Research Institutions for Knowledge Sharing

Global and local collaboration is crucial in addressing climate challenges. By forming partnerships with international institutions and other partners, Kulhudhuffushi City can benefit from shared knowledge, research, and innovative adaptation solutions, while promoting the integration of city-specific climate challenges into research and educational initiatives carried out in the city.

Sub-action 2.2.1:

Collaborate with other city councils in different countries. This partnership allows for the exchange of ideas and best practices, helping Kulhudhuffushi City adopt proven adaptation measures from around the world.

Sub-action 2.2.2:

Develop formal MoUs with international research institutions to exchange data and findings on climate adaptation. These agreements will facilitate access to cutting-edge research on climate impacts and potential responses, ensuring Kulhudhuffushi City stays updated with global trends.

Sub-action 2.2.3:

Encourage collaborative research projects on climate risks and responses, emphasizing Kulhudhuffushi City's local context. Promote joint studies that assess city-specific climate vulnerabilities and explore tailored solutions. Collaboration with research institutions, including MNU, can support locally focused research. MNU's local campus currently offers 'Advanced Certificate in Environmental Management' while the main campus also has 'Diploma/ Bachelor of Science in Climate Change' and 'Master of Science in Geospatial Technologies for Disaster Management', and partnerships with such educational institutions can help integrate the city's climate challenges into research efforts. Additionally, promote environmental courses conducted in Kulhudhuffushi to incorporate local context into their modules and research

components, ensuring studies are directly relevant to the city's unique challenges.

Sub-action 2.2.4:

Training and development for civil staff and capacity building. Invest in training programs for local government staff to improve their understanding of climate resilience, equipping them with the skills necessary for effective disaster response and climate adaptation planning.

Action 2.3: Work in partnership waste management service providers for a safe, resilient waste management system

As extreme weather events can compromise waste management systems, ensuring that medical facilities have resilient infrastructure for managing hazardous and other types of waste is crucial to public health. ²

This action also links to Action 4.4 of this plan.

[DMP 2025: 1.7.1]

[LDP 2022-2026: Strategy 3.1]

Sub-action 2.3.1:

Partner with waste management service providers to set up a proper collection and disposal system, with emphasis on the safe transport and treatment of medical waste.

This action will involve working with local waste management providers to implement a resilient waste collection and disposal system for medical facilities. Special attention will be given to the safe handling and transportation of medical waste, ensuring it does not pose a health risk during or after extreme weather events.

Sub-action 2.3.2:

Partner with waste management service providers to inform the locals of the waste segregation protocol.

Partnering with waste management service providers aims to educate the community about

proper waste segregation protocols. This initiative will help residents understand the importance of separating waste types (organic, recyclable, and non-recyclable) to promote efficient waste management, reduce environmental impact, and support sustainable practices in the community. Through public awareness campaigns, workshops, and informative materials, locals will be guided on how to follow the protocol effectively.

Strategy 3: Up-to-Date Information Collection and Dissemination



Action 3.1: Collect Data to Set Up a Data Hub

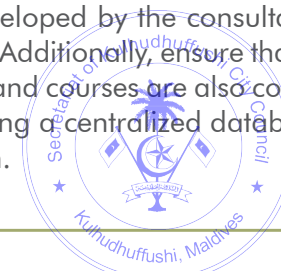
To create a centralized repository of climate data, it is essential to invest in technology that enables continuous data collection and analysis. The development of the data hub must start somewhere; therefore, integrating existing general and local resources, such as data from the MET Office, MNU, and the interactive map (ArcGIS experience builder) prepared by the consultant for Kulhudhuffushi City, can serve as a starting point.

[LDP 2022-2026: Strategy 50.1]

Sub-action 3.1.1:

Establish a data hub and integrate existing climate and environmental data sources.

Utilize available resources such as the Environmental Management System (EMS) by EPA, weather and air quality monitoring data from the MET Office, monitoring data from MNU, and the GIS map portal developed by the consultant for Kulhudhuffushi City. Additionally, ensure that data from local research and courses are also collected and included, creating a centralized database of relevant information.





Sub-action 3.1.2:

Collection of climate and environmental data locally.

Purchase digital thermometers and hygrometers to regularly measure temperature and humidity levels. Data will be collected quarterly to monitor environmental conditions. This will be supported by linking the data from the weather station in Kulhudhuffushi Airport and the Maldives National University (MNU) Air Quality Measurement Monitor, enhancing the data hub’s comprehensiveness.

Action 3.2: Adopt Data Analysis and Visualization Tools



Utilizing Geographic Information Systems (GIS) and other analytical tools can enhance the understanding of climate data and inform strategic decision-making.

Sub-action 3.2.1:

Establish climate change data collection and visualization capabilities within the KCC. This will involve training personnel on GIS tools and creating visual dashboards that present climate data in an accessible format, facilitating informed decision-making and planning.

Action 3.3: Data Dissemination

Effective dissemination of data is crucial for engaging stakeholders, raising awareness, and fostering collaboration on climate resilience efforts.

[DMP 2025: 1.3.1, 1.8.3, 2.2.4]

Sub-action 3.3.1:

Create a shared digital platform, such as a cloud-based database or a Viber/WhatsApp group, where stakeholders can easily share real-time

updates on ongoing climate resilience projects and emerging risks. This collaborative space will enhance communication, foster partnerships, and enable quicker responses to climate-related challenges.

Sub-action 3.3.2:

Publish quarterly data reports on a dashboard or through messaging platforms, providing stakeholders with timely updates on climate conditions and resilience initiatives. This transparency will encourage community engagement and support for climate adaptation measures.



A main road of Kulhudhuffushi City
Image credit: MRC team



An inner road of Kulhudhuffushi City, 2025
Image credit: Charrette team





Strategy 4: Sustainable Urban Planning



Action 4.1: Ensure the Integration and Preservation of Green and Open Spaces

Green and open spaces are essential for urban resilience, providing natural drainage, reducing heat, and enhancing community well-being. Properly designated and preserved green spaces can act as natural buffers against extreme weather.

[LDP 2022-2026: Strategy 45.1]

Sub-action 4.1.1:

Allocate 10 - 15% of land for green and open spaces in the planning guidelines and the LUP.

Designating a specific percentage of land for green spaces ensures that development does not encroach on vital natural areas, contributing to both environmental sustainability and community well-being.

Sub-action 4.1.2:

Preserve existing green and open spaces by restricting permanent structures.

By preventing construction in designated green areas, these spaces remain untouched, serving as natural buffers against heat and floods while enhancing air quality.

Sub-action 4.1.3:

Designate and protect green spaces in the LUP as no-build zones.

Green spaces designated as no-build zones in official plans receive legal protection, ensuring their long-term preservation and contribution to urban greenery.

Sub-action 4.1.4:

Ensure green spaces are easily accessible within walking distance of residential areas.

Strategic placement of green spaces ensures they are convenient for community use, promoting a healthier lifestyle and enhancing social cohesion.

Sub-action 4.1.5:

Promote community-focused, green spaces in residential developments.

Encouraging developers to incorporate parks and open spaces into housing areas enhances the quality of life for residents and fosters a sense of community.

[LDP 2022-2026: Strategy 10.3]

Action 4.2: Rejuvenate the Green Buffer (Heylhifah) Around the Island

A healthy green buffer protects the island from natural hazards and reduces erosion. Reclaiming and restoring this area can offer long-term protection and environmental benefits.

[DMP 2025: 1.10.1]

[LDP 2022-2026: Strategy 41.1, 43.1]

Sub-action 4.2.1:

Reclaim a 20-meter green buffer around the island by replanting trees.

Reclaiming and replanting trees in the green buffer zone strengthens natural defenses against erosion, offering long-term protection against climate impacts.¹

Sub-action 4.2.2:

Map Environmental Protection Zones (EPZ) and relocate or re-purpose built-up spaces within the green buffer.

Identifying EPZs helps to remove or re-purpose

built structures that compromise natural buffers, restoring the area to its original environmental function.

Action 4.3: Adopt the Sponge City Concept



The Sponge City concept uses natural solutions like permeable surfaces and rain gardens to manage storm water. This reduces flooding, improves water management, and enhances urban greenery.

[DMP 2025: 1.2.1, 1.5.1, 1.9.1]

[LDP 2022-2026: Strategy 10.3, 42.1]

Sub-action 4.3.1:

Designate vacant lots for water drainage using permeable surfaces like green roofs and rain gardens. After classifying based on size, new parks can also have such features included in their design.

Permeable surfaces allow rainwater to seep into the ground, reducing the risk of flooding and improving groundwater recharge, particularly in urbanized areas.

Sub-action 4.3.2:

Ensure adequate drainage systems in undeveloped areas through expert assessments.

Engineering evaluations can help identify and recommend effective solutions to prevent waterlogging in developing areas of the city.

Sub-action 4.3.3:

Introduce road side greenery as a natural drainage.

The new roads should design a green verge to include plants and trees to function as soak pits.

[LDP 2022-2026: Strategy 4.2]

Action 4.4: Establish and enhance the city's waste management system

A sustainable waste management system is critical for maintaining a clean, healthy environment. Encouraging segregation, recycling, and composting can help reduce waste and promote responsible disposal.²

This action also links to Action 2.3 of this plan.

[DMP 2025: 1.7.1]

Sub-action 4.4.1:

Improve waste collection, segregation, and disposal systems in collaboration with WAMCO.

A reliable waste collection system reduces environmental pollution and enhances sanitation, making the city cleaner and more sustainable.

Sub-action 4.4.2:

Encourage waste reduction and recycling initiatives among the community.

Promoting recycling and waste reduction programs, and educating the public on sustainable practices, leading to less waste and a more circular economy.

Sub-action 4.4.3:

Introduce composting programs and provide training to residents.

Composting organic waste reduces landfill use and provides nutrient-rich soil for gardening, benefiting both the environment and local agriculture.

Sub-action 4.4.4:

Ensure proper disposal of medical waste to avoid health hazards.

Medical waste disposal is critical for preventing health risks, particularly in times of pandemics or public health crises.

Sub-action 4.4.5:

Promote jumble sales and second-hand markets to encourage recycling.





Hosting regular sales and second-hand markets encourages a culture of reusing goods, reducing the volume of waste produced.

Sub-action 4.4.6:

Develop innovative solutions for converting waste into energy or resources.

Encouraging innovation in waste-to-energy technologies or waste-to-resource programs promotes environmental sustainability and economic benefits.

Action 4.5: Review and update of plans

Most of the plans and development guiding documents are designed for a specific timeframe and must be regularly reviewed, updated, and revised to remain relevant and effective.

Sub-action 4.5.1:

The LUP should be revised every five years, and other development and guiding documents should be updated according to their set timeframes. This ensures that plans remain relevant, fit the current context, and address all necessary areas.

Strategy 5: Resilient Infrastructure

[DMP 2025: 1.4.2, 1.4.3]



Action 5.1: Develop canopies to combat heat

Creating natural and artificial shaded areas in public spaces helps reduce heat exposure, particularly during the hotter months. Shaded areas enhance comfort and protect vulnerable populations from heat stress.

Sub-action 5.1.1:

Introduce shaded areas in public spaces, such as schools, mosques, and markets, using trees or canvas canopies. Providing natural and artificial shade in high-traffic areas enhances comfort and offers relief from heat, especially during the dry season.¹

Action 5.2: Ensure Critical Buildings Are Situated Away from Disaster-Prone Areas

Locating critical infrastructure outside disaster-prone areas ensures long-term resilience. Hazard risk maps should guide the development of essential services to minimize exposure to flooding and other risks.

This action also links to Action 1.1 of this plan.

Sub-action 5.2.1:

Plan critical infrastructures of the city away from the flood prone areas identified in the city hazard maps.

Hazard-risk maps identify areas vulnerable to disasters, such as flood prone zones and near fuel and gas storages, helping planners avoid constructing critical infrastructure like hospitals and schools in high-risk zones, thus minimizing potential damage.

Action 5.3: Introduction of Alternative Transportation Modes to Reduce Vehicular Emissions

Promoting eco-friendly transportation options like biking and walking can reduce emissions and improve air quality. Developing infrastructure for alternative modes of transport makes commuting more sustainable.

Sub-action 5.3.1:

Increase bus routes for better public transportation coverage.

Expanding bus services makes public transportation more accessible, reducing reliance on private vehicles and lowering overall emissions.

Sub-action 5.3.2:

Introduce bike lanes along major roads.

Bike lanes provide a safe, eco-friendly alternative to driving, encouraging more people to cycle and reducing vehicular emissions.

Figure 7, included on page 61 at the end of Theme 2 strategies and actions, is a conceptual plan illustrating an example of incorporating bike lanes into existing main roads.

Sub-action 5.3.3:

Designate pedestrian-only streets during weekends.

Weekend pedestrian streets promote walking and cycling, reduce traffic congestion, and create more sustainable urban environments.

Sub-action 5.3.4:

Promote e-bikes and e-scooters as eco-friendly alternatives through awareness campaigns.

Campaigns that highlight the benefits of electric bikes and scooters can encourage their adoption, further reducing carbon footprints.

Action 5.4: Implement Coastal Solutions to Minimize Coastal Recession and Flooding

Coastal protection measures are essential to address the impacts of rising sea levels and erosion. Identifying and implementing effective hard and soft coastal solutions can safeguard vulnerable coastlines.

[DMP 2025: 1.10.2]

Sub-action 5.4.1:

Conduct studies to identify appropriate coastal protection measures such as breakwaters, groynes, and beach nourishment.

Studies on the effectiveness of different coastal protection measures guide decision-making on the best combination of hard and soft solutions to prevent coastal erosion and flooding.

Sub-action 5.4.2:

Construct and maintain coastal protection for the eastern coastline.

The construction and upkeep of coastal defenses will protect vulnerable areas from ongoing sea-level rise and storm surges.

Action 5.5: Promotion of Green Buildings

Green building principles reduce energy consumption, improve comfort, and enhance adaptability to climate change. Promoting these practices can lead to a more sustainable urban landscape.

[DMP 2025: 1.2.1, 1.5.1, 1.9.1]

Sub-action 5.5.1:

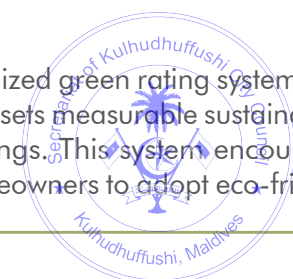
Awareness and Knowledge Sharing Regarding Building Design Principles and Energy-Efficient Designs

This action focuses on educating the community and developers about sustainable building design principles. It involves the distribution of limited pamphlets, social media and the sharing of knowledge on how to reduce heat gain, maximize natural sunlight, incorporate greenery within homes, and select eco-friendly building materials. These strategies aim to enhance energy efficiency, reduce environmental impact, and improve indoor living conditions.

Sub-action 5.5.2:

Adopt a Green Rating System (e.g., EDGE or BREEAM)

Introducing a recognized green rating system such as EDGE or BREEAM sets measurable sustainability standards for buildings. This system encourages developers and homeowners to adopt eco-friendly





practices by providing a framework for evaluating and improving the environmental performance of new and existing buildings. The rating system covers aspects like energy and water efficiency, waste management, and material sustainability.

Sub-action 5.5.3:

Launch a Pilot Project to Encourage the Inclusion of Green Roofs, Rainwater Harvesting Systems, Solar Panels, and Natural Ventilation

The pilot project will showcase innovative green building features such as green roofs, rainwater harvesting systems, solar panels, and natural ventilation techniques. These technologies are designed to reduce energy consumption, improve water conservation, and enhance the adaptability of buildings to climate change impacts. This pilot will serve as a model for future developments, demonstrating the benefits of integrating sustainable building solutions. ³

Action 5.6: Coastal Habitat Restoration and Protection

This major action focuses on restoring and enhancing coastal ecosystems to increase their resilience and provide natural protection against erosion, storm surges, and rising sea levels. It involves integrating artificial structures, like reefs, with natural habitats, such as mangrove forests, to strengthen the coastline's defense system. Mangroves serve as natural barriers that reduce wave energy and stabilize sediment, while artificial reefs add structure and further dissipate wave force. Together, they create a synergistic effect that enhances coastal protection while promoting biodiversity and ecosystem health. This strategy also supports fish populations, improves water quality, and provides additional resources for local communities.

[DMP 2025: 1.10.2]

[LDP 2022-2026: Strategy 42.1]

Sub-action 5.6.1

Integrate artificial reefs with natural mangrove ecosystems for enhanced coastal protection.

Combining artificial reefs with mangrove ecosystems can provide an extra layer of coastal defense, reducing erosion and wave energy impacts.

Action 5.7: Climate Proof all Critical Infrastructure

This action focuses on enhancing the resilience of critical infrastructure and retrofitting key facilities. It aims to safeguard vital equipment and ensure that facilities like hospitals and power house are better equipped to handle climate-related challenges.

[DMP 2025: 2.4.4]

Sub-action 5.7.1:

Climate-proof vital equipment by elevating critical machinery, such as engines, generators, and electrical systems, by installing them on elevated platforms above projected flood levels or higher floors to protect against flooding and storm surges.

Sub-action 5.7.2:

Retrofit key infrastructures by climate-proofing essential facilities, including hospitals, power plants, and water treatment systems, to withstand extreme weather events and enhance climate resilience

Strategy 6: Food, Water, and Energy Security



Action 6.1: Ensuring Food Security

This action focuses on securing food availability during crises by developing emergency distribution plans, promoting climate-resilient urban and

community farming, increasing storage capacities, and providing technical support for sustainable agricultural practices. It aims to reduce dependence on external supply chains and enhance local self-sufficiency.

[DMP 2025: 1.2.3, 1.6.1]

[LDP 2022-2026: Strategy 32.5]

Sub-action 6.1.1:

Develop, approve, and implement a comprehensive Food Security Emergency Plan to ensure a reliable food supply during disruptions caused by natural hazards or global supply chain issues.

This plan will outline the distribution process, identify secure storage locations, and define the roles and responsibilities of local authorities, businesses, and communities in maintaining food availability.

Sub-action 6.1.2:

Allocate Space to Increase Warehousing Capacity for Government and Private Businesses by Allocating Plots of Land, Keeping in Mind Regional Storage Reliance and Requirements.

To safeguard food supplies, the government will allocate space for constructing climate-resilient warehouses. These facilities will provide increased storage capacity for both government and private sector food reserves, ensuring a stable food supply during disruptions.

Sub-action 6.1.3:

Promote urban and community farming initiatives to achieve self-sufficiency.



By encouraging the development of urban farms and community gardens, this action will foster local food production, reduce dependence on external sources, and enhance overall food security in the community.

This sub-action also links to sub-action 9.1.3 of this plan.

[LDP 2022-2026: Strategy 32.6]

Sub-action 6.1.4:

Develop and implement training programs for Climate Resilient Agriculture (CRA) practices, while providing technical support to farmers.

These programs will educate farmers on best practices such as using climate resilient crops, sustainable water management techniques, and organic farming methods. This initiative will strengthen the capacity of local farmers to adapt to climate challenges, ensuring long-term food security.

Action 6.2: Ensuring Energy Security

This action aims to enhance energy resilience by promoting renewable energy solutions like solar power, offering incentives and financing for households and businesses to adopt energy-efficient technologies, and mandating energy efficiency standards for new and existing buildings. Public awareness campaigns will be conducted to encourage energy-saving practices, ensuring sustainable and reliable energy access in the face of climate change.

[DMP 2025: 1.9.2]

[LDP 2022-2026: Strategy 2.2, 41.2]

Sub-action 6.2.1

Promote Solar Units for Households and Small Businesses



The council will encourage the installation of solar photovoltaic (PV) units on homes and small businesses. This will reduce reliance on fossil fuels, promote clean energy, and contribute to the island's energy self-sufficiency. The number of installed solar units will serve as a key performance indicator for success. ³

Sub-action 6.2.2:

Engage with Suppliers and Promote Solar Energy Products Through Council Resources

Collaboration with solar energy suppliers will





be initiated to offer high-quality solar products. These products will be promoted using council communication channels, such as local advertisements and community outreach, to raise awareness and drive adoption. ³

Sub-action 6.2.3:

Provide Incentives and Financing Options for Households and Small Businesses to Invest in Renewable Energy

The council will work with financial institutions to offer affordable financing options, including loans and subsidies, for households and businesses to invest in solar power systems. Incentives such as tax breaks or rebates will be provided to encourage investment in renewable energy. ³

Sub-action 6.2.4:

Mandate Energy Efficiency Standards for New Buildings, Appliances, and Industrial Equipment

New construction projects and equipment installations will be required to comply with energy efficiency standards. These regulations will ensure that buildings and appliances minimize energy consumption, reducing the overall energy demand on the island.

Sub-action 6.2.5:

Provide Incentives for Retrofitting Old Buildings with Energy-Efficient Technologies

To encourage the modernization of older buildings, the council will offer financial incentives to homeowners and businesses for retrofitting properties with energy-efficient lighting, insulation, and other technologies that reduce energy consumption.

Sub-action 6.2.6:

Conduct Public Awareness Campaigns on Energy-Saving Practices

A series of public campaigns will be launched to educate residents and business owners on how to save energy in their daily lives. These campaigns will cover topics such as efficient lighting, heating,

and cooling practices, along with tips on reducing electricity usage during peak times.

Action 6.3: Ensuring Water Security



This action focuses on strengthening water security by implementing groundwater recharge systems, improving drainage infrastructure, and increasing water storage capacity in public and residential buildings. It promotes sustainable water management practices, such as rainwater harvesting, and provides incentives for incorporating water-efficient technologies. These measures aim to safeguard water resources and ensure reliable access, especially during droughts or supply disruptions due to extreme weather events caused by climate change.

[DMP 2025: 1.4.5, 2.3.3, 2.3.4]

[LDP 2022-2026: Strategy 1.4]

Sub-action 6.3.1:

Assess Groundwater Resources and Explore Engineering Solutions

A comprehensive assessment of groundwater resources will be conducted, and engineering solutions, such as aquifer recharge systems, will be explored to ensure long-term water availability.

Sub-action 6.3.2:

Implementation of Groundwater Nourishment Infrastructure at All Institutions, Residential, and Communal Areas

Infrastructure will be built to capture and filter rainwater, replenishing the groundwater supply. This will involve retrofitting residential, institutional, and communal areas, such as roadsides, with groundwater recharge systems to mitigate water scarcity.

Sub-action 6.3.3:

Roadside Drainage Systems

New roadsides will be designed with efficient drainage systems to prevent water logging and allow storm water to flow into designated catchment areas. These systems will be critical in managing rainwater runoff, especially during heavy rains.

[LDP 2022-2026: Strategy 4.6]

Sub-action 6.3.4:

Create Space for Water Storage Capacity in Public and Community Buildings via Planning and Development Guidelines

New public and community buildings will be required to include water storage solutions, such as fire tanks or water reservoirs. These storage systems will ensure adequate water availability during emergencies, targeting a minimum capacity to last for at least three days.

Sub-action 6.3.5:

Design Parks and Public Spaces to Allocate Space for Underground Water Tanks

Public spaces, such as parks, will be integrated with water storage infrastructure, including underground water tanks, to capture and store rainwater. This strategy aims to optimize the use of public land for dual purposes, enhancing both water security and green space.

Sub-action 6.3.6:

Incentivize and Subsidize Water Security and Capacity in New Buildings

The council will provide financial incentives and subsidies to encourage the inclusion of water-saving technologies in new buildings. These could include rainwater harvesting systems, efficient plumbing fixtures, and greywater recycling, all designed to reduce water consumption and improve water security.

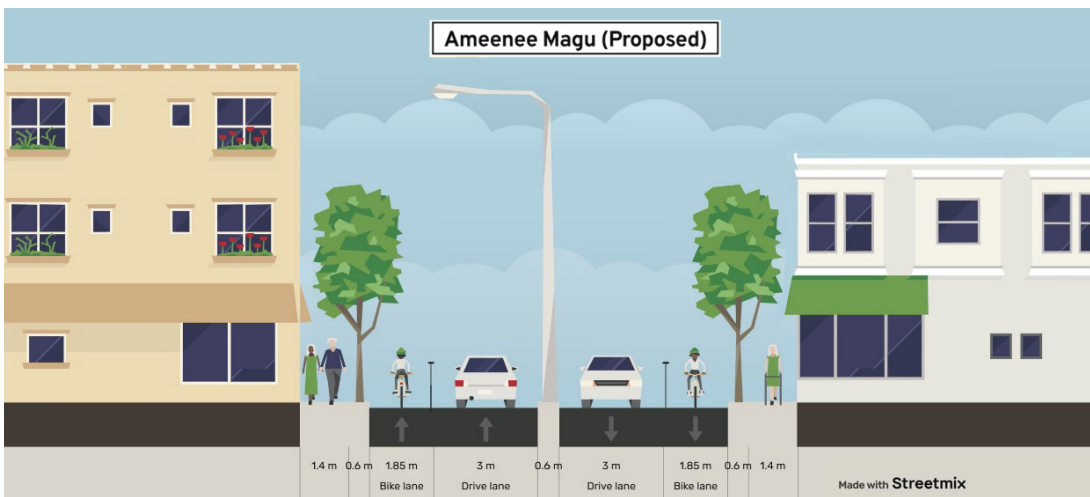
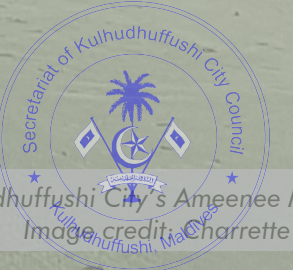


Figure 7. In reference to 'action 5.3.2: Introduce bike lanes along major roads', a conceptual plan prepared to propose an example of how bike lanes can be incorporated to the existing Ameen Magu.





Kulhudhuffushi City's Ameenah Magu
Image credit: Charrette team



Strategy 7: Economic Development to Fight Against Climate Change



Action 7.1: Develop Alternative Income-Generating Activities (Solar-Powered Livelihood Programs) for Vulnerable Communities

To support vulnerable groups and ensure their economic resilience against climate impacts, alternative livelihood programs should be prioritized. By equipping select groups with solar-powered tools, these communities can develop small-scale enterprises in various sectors such as fish drying, food processing, home-based work, and cold storage for perishable goods. Solar-powered technology is a critical aspect of this initiative, reducing reliance on conventional energy sources while increasing the economic self-sufficiency of vulnerable communities.

[DMP 2025: 1.6.2]

[LDP 2022-2026: Strategy 33.1, 33.4]

Sub-action 7.1.1:

Equip vulnerable groups with solar-powered equipment for small-scale enterprises like fish drying, food processing, home-based businesses, or refrigeration for perishable goods. This action links directly to broader behavior change campaigns (BCC) that emphasize sustainable energy use and community resilience.³

This initiative can be implemented in collaboration with donor agencies, leveraging their resources and expertise to enhance its reach and sustainability.

Action 7.2: Promote Eco-Tourism as a Sustainable Tourism Product

Eco-tourism offers a way for Kulhudhuffushi City to build a tourism brand that aligns with sustainability

principles while providing economic benefits to the community. By developing a local eco-tourism brand, the island can attract tourists interested in responsible travel, minimize environmental impacts, and promote climate-resilient practices. Emphasizing water conservation, solar energy, waste management, and composting will help make Kulhudhuffushi City a model for sustainable tourism in the Maldives.

[DMP 2025: 1.6.2]

[LDP 2022-2026: Strategy 35.2]

Sub-action 7.2.1:

Develop a branding strategy for Kulhudhuffushi City that incorporates sustainability principles, such as promoting the use of filtered water, a specified percentage of solar energy, responsible waste management, and composting. Establish eco-tourism guidelines under related campaigns to promote and ensure proper implementation of eco-tourism models.^{2,3}

Sub-action 7.2.2:

Implement a scoring system to incentivize eco-friendly tourism businesses.

New tourism opportunities, such as tourism plots, should prioritize businesses with eco-friendly models. A scoring system will be used to assess sustainability efforts, rewarding businesses through subsidies and incentives based on their eco-friendly practices.

Action 7.3: Introduce Programs to Help Small Businesses Increase Their Resilience

Small businesses are highly vulnerable to climate-related disruptions like flooding and storms. To ensure the resilience of local businesses, workshops will be organized to teach owners how to identify climate risks and implement emergency preparedness strategies. These programs will focus

on business continuity, evacuation planning, and preparedness for extreme weather events.

[DMP 2025: 2.2.1, 2.2.2]

Sub-action 7.3.1:

Organize workshops for business owners to help them identify climate-related risks such as flooding and storms, and assess how these threats could disrupt their operations. These workshops will also focus on how to better prepare for such risks.

Sub-action 7.3.2:

Conduct training for business owners and their staff on emergency preparedness, including evacuation plans, business continuity strategies, and responses to extreme weather events, using plans proposed in the DMP. The training will also cover strategies for quickly resuming operations after disruptions, ensuring businesses can bounce back stronger.

Action 7.4: Green Business Certification

Promoting environmentally friendly business practices is a key aspect of fostering climate resilience. A local green business certification program will be developed to recognize and reward businesses that adopt climate-smart practices, such as water conservation, the use of solar energy, and other eco-friendly initiatives.

Sub-action 7.4.1:

Develop a certification program to recognize businesses that adopt eco-friendly and climate-resilient practices, including water conservation, solar energy use, and responsible waste management.^{2,3}

Action 7.5: Plan and Implement Climate-Change Related Community Projects with NGOs

Collaboration with local NGOs, Civil Society

Organizations (CSOs), and small businesses is essential for scaling up community-based climate adaptation projects. These projects will address local climate challenges and build community resilience by leveraging NGO expertise and securing funding. Proper monitoring and progress assessments must be conducted for these projects. This action also links to Action 9.1 of this plan.

Sub-action 7.5.1:

Secure funding for climate change-related community projects by exploring various funding sources, including grants, partnerships, and sponsorships. Identify and collaborate with suitable NGOs, CSOs, or small businesses with relevant expertise to effectively implement these initiatives.

Sub-action 7.5.2:

Establish a monitoring and evaluation framework to track project progress and ensure alignment with climate resilience goals. Conduct regular assessments and oversight to measure impact, address challenges, and ensure successful implementation.

Strategy 8: Climate Financing



Action 8.1: Introduce Programs for Green Financing for Households and Small Businesses

Supporting households and small businesses in transitioning to renewable energy sources is essential for building local resilience and reducing greenhouse gas emissions. Green financing programs can provide the necessary financial support to encourage the adoption of sustainable practices.

[DMP 2025: 1.1.6, 1.9.2]





Sub-action 8.1.1:

Partner with local banks and financial institutions to develop affordable loan schemes with favorable terms for the installation of solar units. This partnership will involve creating MoUs to formalize collaboration and ensure alignment of goals, and makes it easier for the citizens to adopt the technology.³

Sub-action 8.1.2:

Design programs where the council co-finances or guarantees a portion of the cost in adoption of renewable energy technologies, for low-income households or small businesses. This approach will lower the financial barrier for vulnerable groups and promote widespread adoption of such technologies.

Sub-action 8.1.3:

Create awareness campaigns to inform households and small businesses about the availability of green financing options and the benefits of solar energy. These campaigns will educate the community on the economic advantages of transitioning to renewable energy, thereby increasing participation in green financing programs.³

Action 8.2: Micro Grants for Resilience Projects



Micro grants can empower communities to undertake local resilience projects that address specific climate challenges. By providing financial support for innovative initiatives, Kulhudhuffushi City can enhance its adaptive capacity.

[DMP 2025: 1.1.6]

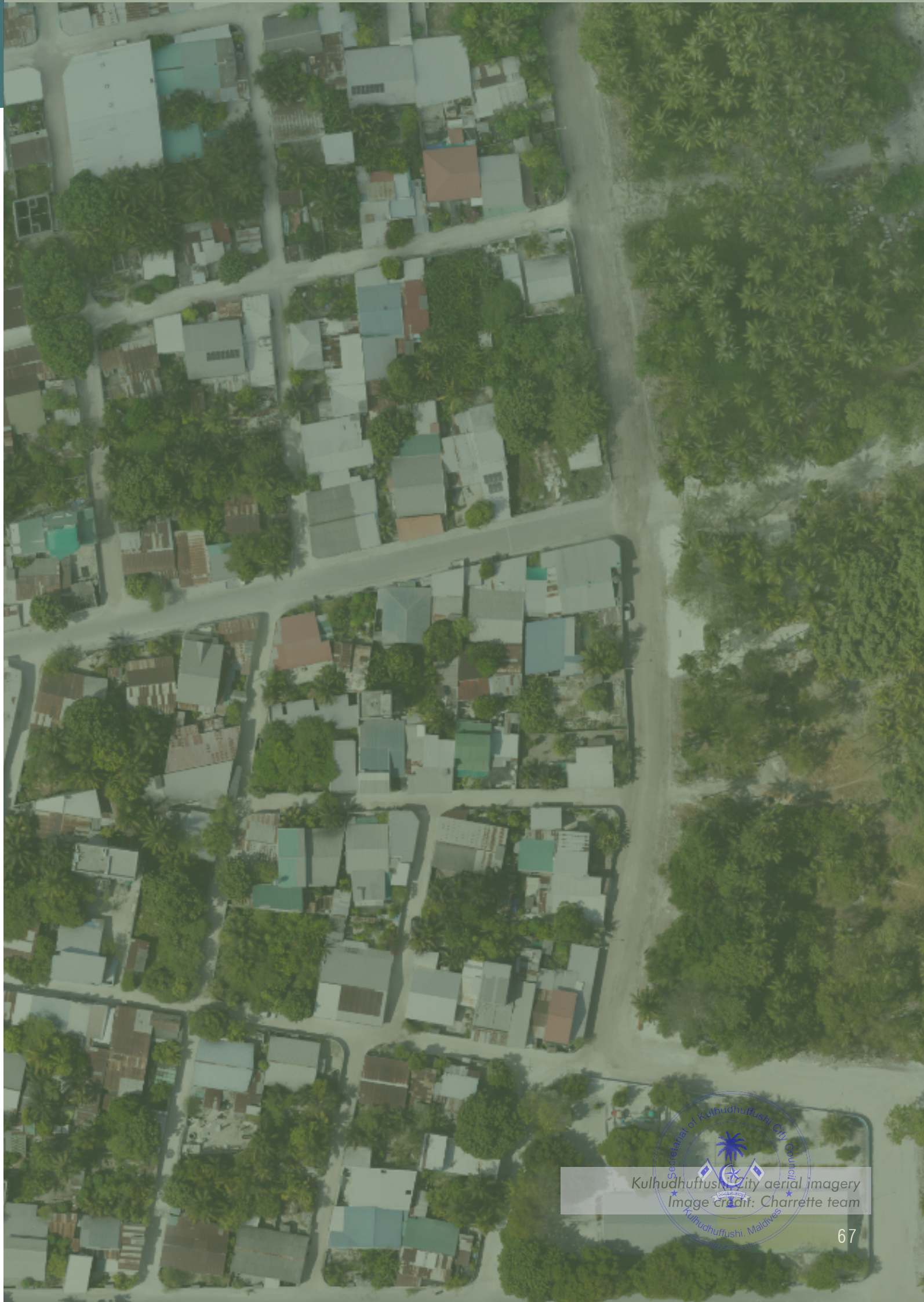
Sub-action 8.2.1:

Partner with banks and other financial institutions to provide micro grants for these community-led projects. Collaborating with financial partners will enhance the pool of resources available for

community initiatives and increase the overall impact.

Sub-action 8.2.2:

Develop grant application guidelines and criteria focused on community-led resilience initiatives, such as rainwater harvesting, flood prevention, and eco-friendly infrastructure. Clear guidelines will ensure that the funding process is transparent and accessible.





Strategy 9: Community Empowerment



Action 9.1: Conduct community events and workshops organized to enhance social bonding and resilience



Community events and workshops provide a platform for building strong social networks that are essential during times of crisis. These events will not only increase awareness of climate risks but also provide practical tools and knowledge that can strengthen community resilience.

Events will incorporate culturally significant activities like Eid feasts and sports to enhance inclusivity and engagement. A monitoring framework with follow-ups to assess practical application. Recognition programs and leadership opportunities will be included to help retain trained individuals.

This action also links to Action 7.5 of this plan.

[DMP 2025: 1.1.1, 1.1.3, 1.1.4, 1.1.7, 1.2.3, 2.1.1, 2.4.9]
[LDP 2022-2026: Strategy 9.1, 9.2, 22.3]

Sub-action 9.1.1:

Identify key community leaders, groups, and stakeholders to co-design events.

The first step involves identifying influential figures within the community, including leaders, youth groups, women & children's organizations, and other relevant stakeholders. These leaders will play a pivotal role in co-designing events, ensuring they are inclusive, and reflective of their needs.

To ensure inclusivity and engagement, the events will extend beyond traditional gatherings in official settings to include culturally significant activities such as Eid feasts, sports events, and other social celebrations that foster community bonding.

Sub-action 9.1.2:

Partner with local NGOs to organize awareness

campaigns on the benefits of climate resilience.

Local NGOs with expertise in climate change, disaster risk management, and social development will be key partners in organizing campaigns. These campaigns will focus on educating the community about the importance of climate resilience and the practical steps they can take to safeguard their environment and livelihoods. The involvement of NGOs will ensure that the campaigns are well-resourced and based on global best practices tailored to the context of Kulhudhuffushi City.

Sub-action 9.1.3:

Develop event themes around disaster preparedness, community farming, and neighborhood-level climate action.

To ensure that the community events are impactful, the themes will be developed around pressing climate issues. Disaster preparedness will focus on preparing residents for natural hazards such as floods, storms, and extreme heat. Community farming initiatives will promote local, sustainable agriculture as a response to food security concerns. Neighborhood-level climate action will encourage localized efforts, such as tree planting, waste management, and sustainable water practices, fostering a collective sense of environmental stewardship.^{1,2}

This sub-action also links to sub-action 6.1.3 of this plan.

Sub-action 9.1.4

Offer workshops that include interactive activities such as scenario planning, and role-playing to strengthen participation

Workshops will take an interactive approach to learning, incorporating scenario planning exercises to envision potential future climate impacts, and role-playing activities that enable participants to practice decision-making during crises. These hands-on activities will increase engagement and ensure that community members are equipped with the practical skills needed to respond effectively to climate risks.

Sub-action 9.1.5

Monitoring of events and training programs for sustainability.

A monitoring and evaluation framework is to be formulated and used, to track participation, feedback, and the effectiveness of the knowledge shared, while regular follow-ups will assess how attendees apply the tools in their daily lives. This information can be used to further refine future events planned.

To retain trained individuals, recognition programs, peer engagement initiatives, and opportunities to lead future workshops will be introduced, ensuring a committed and active community network.

Action 9.2: Initiatives Promoting Cultural Heritage Preservation as Part of Resilience Efforts

Cultural heritage can be an essential component of climate resilience. By preserving local traditions and intergenerational knowledge, the community can reinforce values of environmental stewardship. These efforts also ensure that culturally sensitive practices are passed on to younger generations, aligning cultural preservation with climate adaptation strategies.

[LDP 2022-2026: Strategy 9.1, 9.2, 22.3, 39.1, 39.3]

Sub-action 9.2.1:

Organize storytelling events focusing on local traditions and historical practices related to environmental conservation. These events will provide a platform for elders to share traditional methods of conservation and environmental management, fostering a sense of identity and climate responsibility within the community.

Sub-action 9.2.2:

Partner with cultural institutions and elders to document and promote climate-friendly traditional knowledge. Collaborate with local museums, cultural groups, and educational institutions to record and promote practices that have historically

supported environmental balance, such as mangrove conservation or traditional fishing techniques.

Action 9.3: Integration of Climate Change Education into School Outreach Activities

Colleges play a pivotal role in fostering climate awareness among future generations. This action integrates climate change education into school activities and college courses, encouraging young people to engage and professionally pursue fields related to sustainable practices and environmental protection.

[LDP 2022-2026: Strategy 3.3]

Sub-action 9.3.1:

Collaborate with MNU to align the environment and climate courses conducted at MNU, such as 'Advanced Certificate in Environmental Management', to the council's environmental initiatives.

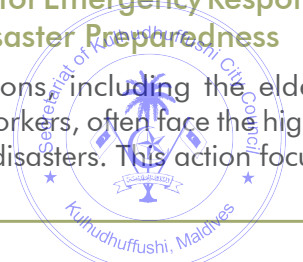
Also, explore opportunities for local students to participate in climate related courses offered in the main MNU campus and other educational institutions, such as 'Diploma/ Bachelor of Science in Climate Change'.

Sub-action 9.3.2:

Schools to design local initiatives for students, such as farming, recycling and composting projects. These hands-on activities allow students to directly participate in sustainable practices, teaching them the value of agriculture, waste management, and community-led adaptation strategies.

Action 9.4: Ensuring the Implementation of Training Programs for Emergency Response, Mitigation and Disaster Preparedness

Vulnerable populations, including the elderly, PWD, and migrant workers, often face the highest risks during climate disasters. This action focuses





on developing and implementing targeted and comprehensive training programs aimed at improving community and institutional readiness for emergencies, disasters, and mitigation efforts. The goal is to equip individuals, first responders, and local authorities with the skills and knowledge needed to respond quickly and effectively to disasters.

[DMP 2025: 1.1.3, 1.1.4, 2.1.1, 2.1.2, 2.1.3, 2.4.5, 2.4.9]

Sub-action 9.4.1:

Conduct comprehensive community risk assessments based on HVCA (2024) findings to identify vulnerable groups and tailor training programs to their specific needs. These assessments will provide the basis for designing emergency response plans that consider the unique vulnerabilities of each group.

Sub-action 9.4.2:

Organize targeted emergency response training sessions in accessible locations for vulnerable populations. Ensuring that training is accessible and relevant will empower at-risk groups, enabling them to act quickly and effectively in emergency situations.

Sub-action 9.4.3:

Develop multilingual and visually inclusive training materials to ensure broad accessibility. By providing training materials in multiple languages and formats (including braille/ tactile and sign language), the city will ensure that everyone, including migrants and individuals with disabilities, can participate in disaster preparedness.

Sub-action 9.4.4:

Incorporate simulation exercises and real-time disaster response drills as part of the training. Regular drills will help the community practice emergency response procedures, ensuring that people are well-prepared to respond to actual disasters.

Strategy 10: Ensuring Health & Well-being in the face of climate risk

Action 10.1: Outreach activities targeting vulnerable populations during extreme weather events.



During climate related events, it is crucial to reach out to those who may not be able to seek help themselves. By organizing outreach activities, we aim to ensure the safety, health, and comfort of vulnerable populations.

Recognizing that it can be difficult to reach everyone, outreach efforts will employ multiple methods, including door-to-door visits, mobile outreach units, and digital communication platforms, to ensure no one is left behind.

[DMP 2025: 2.4.6]

[LDP 2022-2026: Strategy 9.1, 9.2]

Sub-action 10.1.1:

Recruit and train volunteers to check on vulnerable individuals (elderly, PWD, pregnant women) during extreme weather events, via various means such as door-to-door visits, mobile outreach and digital communication methods, to ensure they are safe and comfortable.

City should identify and train volunteers that will be mobilized to conduct home visits, especially during extreme heat events, flooding, or other climate-related emergencies. Volunteers shall be provided with training on how to assess the well-being of vulnerable individuals and offer assistance, ensuring that these groups receive the care and support they need during critical times.

Sub-action 10.1.2:

In partnership with the regional hospital, run educational workshops and distribute flyers, physically and digitally, on safe practices during climate related events.

Collaborating with the regional hospital, city council will organize workshops that inform the community about essential health practices during extreme heat or cold. The distribution of educational materials, through flyers and social media posts, can provide information on safety tips and measure regarding current or predicted climate events. These materials can be periodically rotated to ensure a wide reach among citizens.

Currently Health Protection Agency (HPA) and Maldives Meteorological Service use Viber community groups to timely share information and awareness materials.

Action 10.2: Implementation and reach of mental wellbeing programs addressing climate-related stress.



Climate-related stress, often referred to as climate anxiety, has become a growing concern for many individuals facing environmental challenges. This action focuses on providing mental health support, locally and through online resources, to mitigate the psychological effects of climate change.

[DMP 2025: 2.4.6]

[LDP 2022-2026: Strategy 9.1, 9.2, 28.1]

Sub-action 10.2.1:

Establish a local hotline providing access to qualified counselors or mental health professionals to support individuals experiencing distress or anxiety during extreme weather events or disasters.

A dedicated hotline shall be established to connect residents with mental health professionals. This service is to provide a critical lifeline for individuals experiencing anxiety, fear, or distress due to extreme weather events or ongoing environmental changes, offering them support and guidance.

Sub-action 10.2.2:

Organize small support group sessions in local institutions, to discuss climate anxiety, stress management, and coping strategies for individuals facing stress from climate-related event in partnership with schools, institutions and mental health professionals

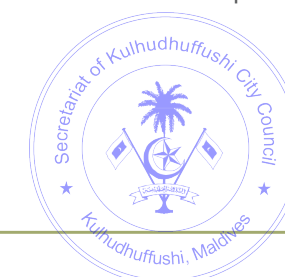
Kulhudhuffushi City Council will work closely with different local institutions to organize group discussions that address climate-related stress. These sessions, facilitated by mental health professionals, would offer a safe space for citizens to talk about their concerns, learn coping mechanisms, and build mental resilience.

Sub-action 10.2.3:

To address the current lack of trained mental health support resources, vulnerable individuals are to be connected with online mental health consultations and resources, to ensure provision of accessible and immediate support during crises.

Action 10.3: Provision of adequately trained professionals for health and other relevant disciplines to respond to changes in climate-sensitive health risks.

As climate change continues to impact public health, it is crucial to equip professionals with the necessary training to address emerging challenges such as vector-borne diseases, heat-related illnesses, and other climate-sensitive health concerns. This training should also encompass mental health support to ensure a comprehensive response.





Sub-action 10.3.1:

Work with educational institutions to develop short certification programs for students and health professionals, focusing on managing climate-sensitive health risks.

In collaboration with educational institutions, introduce certification programs that equip health professionals and students with the skills and knowledge needed to manage climate-sensitive health issues. These programs will provide practical training in dealing with health emergencies exacerbated by climate change, such as extreme temperatures, flooding, and vector-borne diseases.



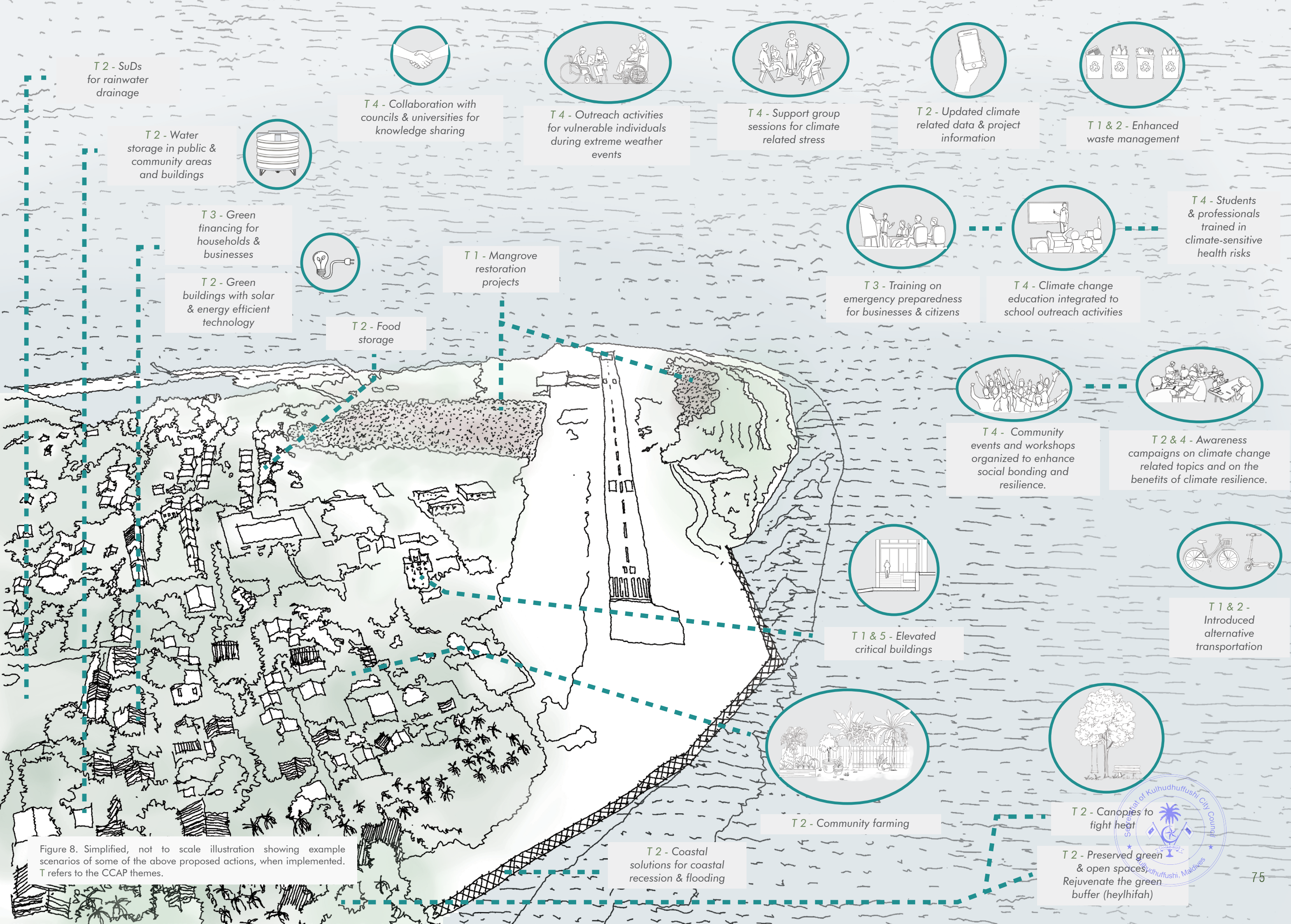


Figure 8. Simplified, not to scale illustration showing example scenarios of some of the above proposed actions, when implemented. T refers to the CCAP themes.





Kulhudhuffushi City aerial imagery
Image credit: Charrette team

07 LOCALIZATION



This chapter looks at the process of adopting strategies and actions to the specific context of a given area. In here, we will highlight the selected and marked strategies and actions from prior chapter, to illustrate how KCC can begin moving towards implementation. While this is not an implementation plan, it draws on best practices from around the world to enhance the KCC team’s and relevant stakeholders understanding.

In this section firstly, we will break down some selected actions and sub-actions and localize to the context of Kulhudhuffushi City.

The following localization write-ups are structured as follows: a brief explanation of the action, a case study(s) showcasing a similar action or initiative carried out elsewhere with key takeaways, and finally, how this action can be applied in the context of Kulhudhuffushi City. At the introduction of each action, icons used will indicate whether the localized action refers to any HVCA (2024) findings, and/or is linked to the DMP (2025), or functions as a cross-cutting strategy connected to other strategies and actions included in this report. It is possible for all, some, or none of these conditions to apply. A legend for these icons has been provided below, for easy reference.

The implementation plan is included in a later chapter.



Linked to HVCA,
2024



Linked to DMP,
2025



Cross-cutting strategy





Theme 1: Governance

Strategy 1 : Develop climate resilient policies and plans

Reference to HVCA: Lack of planning guidelines

Action 1.1:

Introduce planning and development guidelines to ensure climate risk resilience, green and sustainable design and development practices.

As a new land use plan will soon be in place in Kulhudhuffushi City, formulation of climate risk resilience focused planning and development guidelines would be essential for sustainable implementation of the plans. It can be one document or different documents for the different aspects of its implementation.

Some key areas to focus on in developing these guidelines include building designs, height controls, floor space index, setbacks etc.

In addition, it is essential to incorporate green and sustainable guidelines such as green roofs, rainwater harvesting systems, and the use of sustainable materials in building designs. The 2 case studies below presents how such guidelines have helped other countries address climate related risks.



Case Study 1:

Jakarta, Indonesia – Building Elevation for Climate Risk Resilience

To combat frequent flooding, Jakarta requires buildings in flood-prone areas to be built with elevated foundations, raising structures by 1-2 meters. This policy primarily applies to new buildings in vulnerable zones, such as North Jakarta, near rivers and coastal areas. Older buildings undergoing renovations must also comply, either by raising foundations or adopting flood-resistant designs. This has resulted in flood protection, elevated foundations help prevent floodwaters from entering homes and businesses, reducing damage. It also improved resilience. The regulation strengthens community preparedness and resilience against flooding.



Figure 9. An example of a building with elevated plinth level



Figure 10. An example of a building with elevated ground floor slab

Case Study 2:

Toronto, Canada – Green Roof By-law for Climate Resilience



Figure 11. Green Roofs in Toronto

In 2009, Toronto became the first city in North America to implement a mandatory Green Roof By-law, requiring new commercial, institutional, and residential buildings over 2,000 square meters to have green roofs. This policy is part of Toronto's strategy to manage storm water, reduce the urban heat island effect, and improve energy efficiency. Key actions they undertook include having mandatory green roofs; Buildings must cover up to 60% of their roof with vegetation. Example: Toronto City Hall's green roof spans over 3,250 square meters, absorbing rainwater and cooling the building. Green roofs reduce rainwater runoff, helping prevent urban flooding during heavy rains. It also helps in energy saving, insulating buildings to reduce cooling costs, contributing to lower energy consumption and carbon emissions.

Toronto's green roof initiative supports long-term climate resilience by tackling urban flooding and extreme heat.

In context of Kulhudhuffushi:

Engage with the community

Meet the community with the new land use plan, findings of HVCA (2024) and the proposed CCAP to develop attainable guidelines to ensure green and sustainable design and development practices. Identify how can these guidelines be translated to local regulations to make it legally binding.

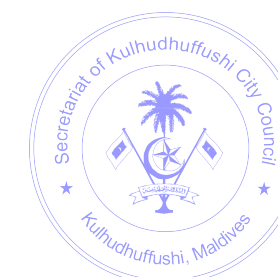
Establish clear guidelines

Some of the guidelines that can be formulated includes:

Set minimum standards to follow with regards to different land uses. For example the council can set a requirement that any land use plan prepared for the city should have at least 15% of the islands land area as open green spaces, this can include open parks, stadiums and mangrove areas.

Set necessary building code requirements for buildings in specific zones. Set guidelines for elevated buildings to minimize flood risk, especially in flood-prone areas (see the flood maps in HVCA, 2024).

- Propose all new developments in flood zones to be elevated to at least 350mm to 550mm above the ground or have an elevated foundation of 350mm to 550mm from NGL, to reduce vulnerability to flooding.
- Propose all critical infrastructures and key institutions such as schools regardless of location to elevate the buildings to at least 350mm to 550mm above the ground.
- Include development controls such as building heights, setbacks, F.S.I. Define maximum building heights that maintain community character while allowing for vertical growth. Set Floor Space Index



(FSI) ratios that balance density and open space. Hulhumale' uses FSI (4:5) to control urban density while ensuring ample open spaces, promoting a livable environment

Encourage green infrastructure. Introduce Green Roofs to the community on its uses and benefits. Introduce a guideline or if possible a regulation requiring new commercial, institutional, and residential buildings over 2,000 square meters to have green roofs.

Develop Local Regulations

Draft and adopt local regulations based on the established guidelines, ensuring they are enforceable and align with the national plans, laws and city level plans such as the proposed land use plan and city development.

Capacity Building and Training

Provide training for local council staff, surveyors, planners, and developers on the new guidelines,

ensuring they understand how to apply them effectively. Host workshops, which train professionals in green building practices.

Promote Incentives and collaborate

Offer incentives for developers who adopt green practices, such as expedited permitting processes, or grants for sustainable projects. Establish partnerships with local environmental organizations, schools, and businesses to support the implementation of green practices.

L - 02

Theme 2: Planning

Strategy 3 : Up-to-date Information Collection and Dissemination

Reference to HVCA: All Hazards and Vulnerabilities

Action 3.2:

Adopt data analysis and visualization tools.

A series of web maps showcasing critical geographic data, thematic layers, and spatial analyses have been developed for this plan. These maps feature Digital Elevation Models (DEMs), tree locations, high and low tide data, and other natural features. Furthermore the current draft Land Use Plan (LUP). These maps are overlaid with highlight hazards such as storm surges and flooding. These detailed maps will be handed over to the Kulhudhuffushi City Council to support future planning efforts, particularly in managing environmental hazards and enhancing urban resilience.



Under this strategy, the council can invest in drone setup to systematically update and maintain Digital Surface Model (DSM), enhance and maintain a GIS dashboard, facilitating the establishment of climate change data collection and visualization within the KCC administration.

To ensure the sustainability and effectiveness of data-driven planning, it is essential to invest in staff training and capacity building. This includes equipping the City Council with the necessary skills to operate GIS software, interpret spatial data, and maintain digital dashboards. The following work plan is proposed for localization.

Case study:

A notable case study of a GIS dashboard is from the Johns Hopkins University, Baltimore, United States. Their COVID-19 Dashboard (Figure 11) was developed to monitor the global spread of the virus. It provided real-time data on cases, fatalities, and recoveries, displayed through

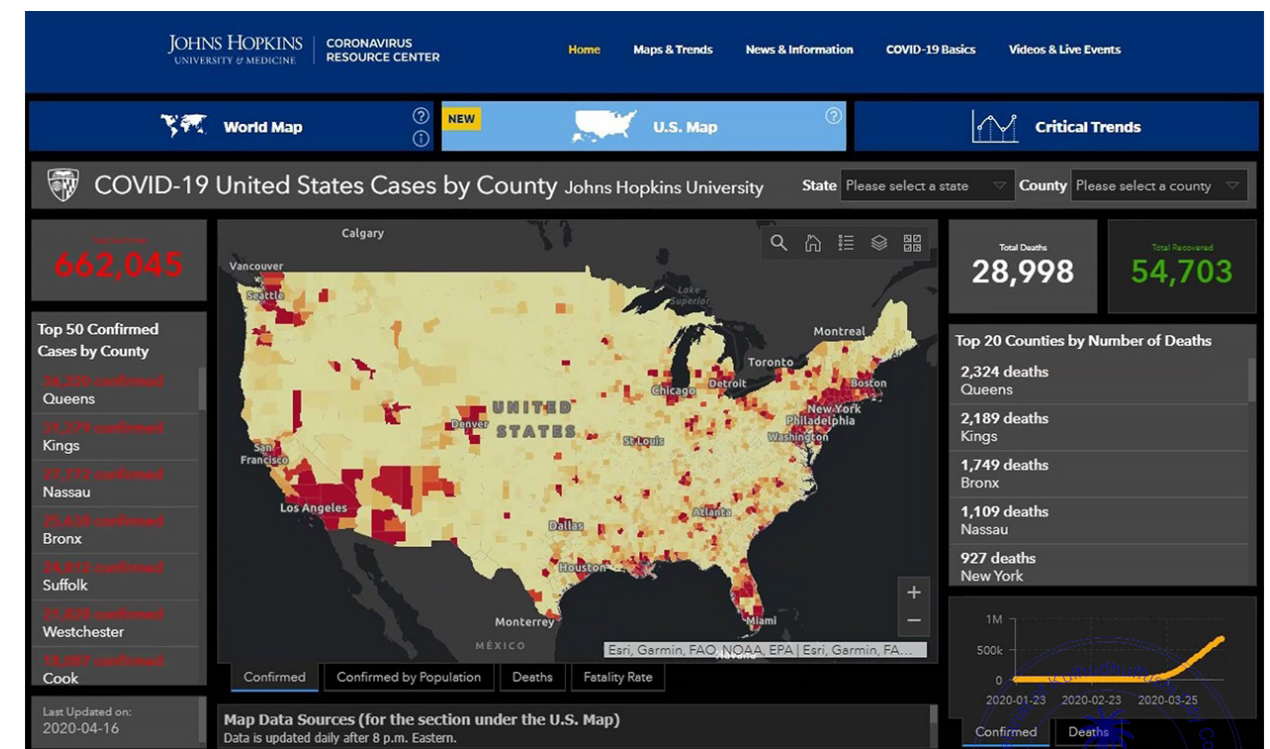


Figure 12. ArcGIS Dashboard Corona Virus Tracking

interactive maps, charts, and tables, helping both the public and government agencies make informed decisions. Built using Esri's ArcGIS Online and integrating data from WHO, CDC, and other health organizations, the dashboard became one of the most widely accessed tools during the pandemic, known for its real-time updates, ease of use, and clarity.

In the context of Kulhudhuffushi:

1. Data Updates and Maintenance

Regularly update the Digital Elevation Models (DEM), land use plans, natural features, and hazard data (e.g., storm surges, flooding).

2. Stakeholder Engagement

Conduct workshops and feedback sessions with local communities and relevant agencies.

3. System Monitoring and Enhancement

Monitor system performance, ensure data accessibility, and update the web interface.

Through operations dashboards, decision makers can view critical information such as outage locations, causes, severity, the number and classification of affected individuals, and estimated restoration times.

L - 03

Theme 2: Planning

Strategy 4 : Sustainable urban planning

Reference to HVCA: Lack of planning guidelines

Action 4.3:

Adopt Sponge City Concept

The sponge city concept emphasizes the use of permeable surfaces, such as pavements, green roofs, and rain gardens, to allow rainwater to infiltrate the ground, thereby reducing surface runoff. It also focuses on rehabilitating natural waterways, such as wetlands, to manage storm water more naturally. By identifying vacant plots in the urbanized areas of Kulhudhuffushi City, this concept can be practically tested. The following detailed outline presents a methodology to activate one of these sites.

Case Study:

The Greener Grangetown project, in Cardiff, UK, is an innovative sustainable drainage system (SuDS) initiative designed to enhance the public realm while improving infrastructure for cyclists and pedestrians (Figure 14). By collaborating with civil engineers and place making experts, the project introduced "rain gardens" that help slow

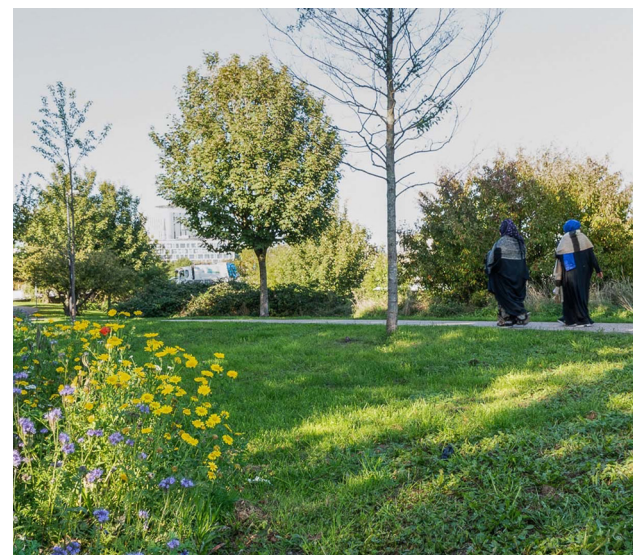


Figure 15. Grangetown's drainage that has been designed to create a more appealing environment



down rainwater runoff, filter out contaminants, and divert clean water directly into the nearby River Taff. You can find more information on this initiative (Arup.n.d).

In the context of Kulhudhuffushi:

Developing a rain garden for a selected site

Site Identification and Assessment

a- Identify and survey vacant plots in urbanized areas. Utilizing the data collected from the HVCA (2024), which includes information on flooding and storm surge, we can leverage GIS maps to aid in selecting appropriate sites. This tool allows for a data-driven approach to pinpoint high-risk areas and prioritize interventions. Some examples of potential sites based on this analysis are provided below for consideration.

b- Conduct soil and hydrological assessments to determine suitability for water drainage.

c- Engage with local stakeholders for feedback on potential sites.

The four images below provide a comprehensive overview of the site identification and assessment process for implementing the sponge city concept. The first image (Figure 15) shows a drone view, highlighting a red-boxed green space within an

urbanized area. The second image (Figure 16) displays a proposed draft land use map, with the orange-boxed area indicating a mix of land uses, including commercial (orange), institutional (purple), and parks (green). The third image (Figure 17) uses GIS data to map heavy flooding zones in red, helping to assess the flood vulnerability of the same blue-boxed green space (for visibility now marked in green). Together, these visuals integrate open space identification, land use, and flood risk to inform strategic site selection for storm water management interventions.

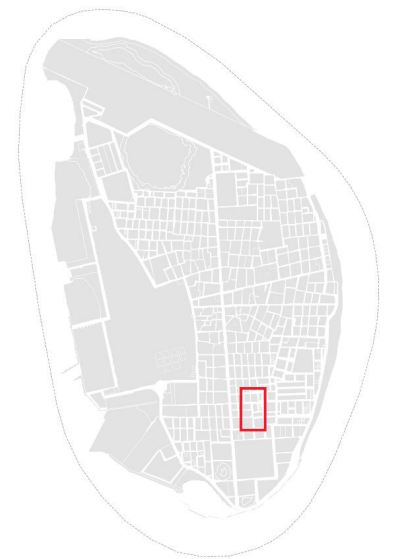


Figure 19. Overview map proposed location, for rain garden site location



Figure 16. Drone image showing open space

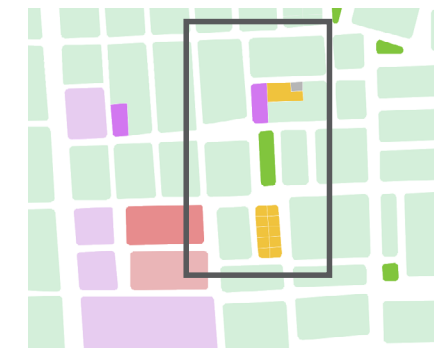


Figure 17. Proposed draft land use plan (LUP)



Figure 18. Mapped heavy flooding zones, in red



Design and Planning

a- Develop a site specific design which incorporates permeable surfaces and natural waterway rehabilitation. Refer to the rain garden technical guide to plan and design the site (Department of Environmental Protection [DEP], 2015).

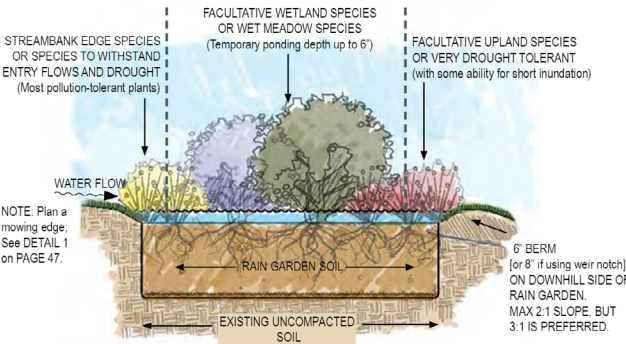


Figure 13. Planting plan; moisture and pollution zones

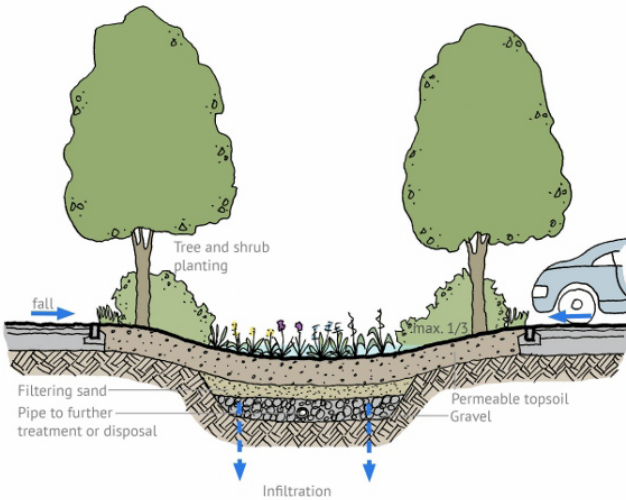


Figure 14. Sustainable drainage system (SuDS) cross section

- b- Select native trees to be planted on the selected site.
- c- Prepare a budget and resource allocation plan.

Implementation

To raise public awareness and support for the sponge city initiatives, the city council can begin by launching a pilot project, accompanied by a city-wide outreach campaign. This campaign will educate residents on the benefits of sponge city features, such as rain gardens, permeable surfaces, and storm water management. The construction of the rain garden will prioritize community participation, encouraging local involvement and fostering a sense of ownership and stewardship. By actively engaging the public in both the planning and execution stages, the council can build widespread support and enhance the success of future projects.

L - 04

Theme 2: Planning

Strategy 6 : Food, Water and Energy Security

Reference to HVCA: Food Security

Sub-action 6.1.3:

Promote urban and community farming initiatives to achieve self-sufficiency.

Kulhudhuffushi City relies heavily on outsourced food, making it vulnerable to supply disruptions. Due to limited land, traditional farming is impractical, but innovative farming techniques for small spaces can provide alternative food sources. These initiatives can enhance food security, reduce import dependence, and improve environmental conditions while fostering community engagement and creating local economic opportunities. Overall, they strengthen the local food system and enhance resilience against climate challenges.



Case Study 1:

Community Farming

In Detroit, Michigan, the Michigan Urban Farming Initiative turned abandoned lots into productive community farms, improving food security and creating local jobs. One such example is agrihoods, short for agricultural neighborhoods.



Figure 20. Michigan Urban Farming Initiative in Detroit, Photo by Michelle Gerard

In Maldives, Villimale’ community garden is one such example



Figure 21. Villimale’ community garden



Case study 2:

Vertical Aeroponics Farming in Singapore

To enhance food security amid limited land, Singapore has adopted vertical aeroponics farming, which allows for sustainable, space-efficient food production. This method involves growing plants in nutrient-rich mist without soil, using up to 90% less water than traditional farming. Community involvement through educational initiatives and urban farming programs has empowered residents and fostered self-sufficiency. Government support through grants further promotes local food production. Overall, this innovative approach not only reduces reliance on imports but also creates jobs and strengthens the local economy, serving as a valuable model for other cities.



Figure 24. The Sky Greens vertical farm in Singapore

In context of Kulhudhuffushi:

Assess Local Needs and Resources

Through awareness and knowledge sharing, assess the community needs and resources.

Community Engagement and Resource mapping

To ensure a successful urban farming initiative, start by conducting community consultations to raise awareness about food security and the importance of self-sufficiency. This will help the community become more resilient against the impacts of climate change, such as extreme weather events and disruptions in the food supply chain. Surveys and consultations should be carried out to assess local food needs, available resources, and community interests. Engaging the community early on will ensure the project is adapted to local contexts and gains strong support from community members.

Identify underutilized urban spaces in Kulhudhuffushi City through resource mapping exercise, such as rooftops, vacant lots, or community parks, that could be transformed into urban farming zones. Assess these areas for access to water, sunlight, and land tenure to determine their suitability for farming.

Choose Appropriate Farming Models

Based on the identified spaces, choose which model can be adopted. Start with a model as a pilot project.

Community Gardens

Shared garden spaces can be organized on vacant land or public areas where residents can work together to grow climate-resilient crops. These spaces would foster community collaboration and increase food self-sufficiency (Figure 22).

Rooftop Gardens

In densely populated areas with limited land, rooftop gardens can be implemented using lightweight soil systems, drip irrigation, and climate resilient crops. For example, Rooftop Republic in Hong Kong successfully uses urban rooftops to produce fresh food locally while also creating green jobs in urban spaces. These gardens can similarly help Kulhudhuffushi City meet local food needs while adapting to climate impacts (Figure 23).



Figure 22. People using roof tops of housing flats, offices and own homes for urban farming in HongKong, a project initiative by the Rooftop Republic



Vertical Aeroponics Farming

Tower Garden® aeroponic technology allows for growing vegetables, fruits, herbs, and flowers using 95% less water compared to conventional farming. It also boosts crop yield and nutrient content. This vertical farming system requires 75% to 90% less space, making it versatile for various locations, from commercial farms and rooftops to school grounds and indoor spaces with grow lights. The system is customizable for different environments, including private backyards and restaurant patios (Figure 24 & 26).



Figure 23. Vertical Farming with Aeroponic Towers



Figure 25. Using Tower Gardens for Homes & Offices

L - 05

Theme 2: Planning

Strategy 6 : Food, Water and Energy Security

Reference to HVCA: Economic vulnerabilities



Sub-action 6.2.1:

Promote Solar Units for Households and Small Businesses.

This falls as a sub-action under the main target of ensuring energy security by promoting and investing in renewable energy to reduce the dependency on fuel.

Case study:

Solar Energy Initiative on Norfolk Island

Norfolk Island, facing high electricity costs and environmental impact due to diesel fuel dependency, launched a government-led program to promote solar energy. The initiative provided financial incentives (grants covering up to 50% of installation costs and low-interest loans) and conducted public awareness campaigns to educate residents about solar energy benefits.

By 2020, 30% of the island’s electricity came from solar, reducing fuel imports and household bills. Public demonstration projects and partnerships with solar suppliers drove widespread adoption. Norfolk aims to achieve 70% renewable energy use by 2025, offering a model for other remote communities.



Figure 26. Installed solar panels

In context of Kulhudhuffushi:

Implementation of solar photovoltaic systems (PV) in Kulhudhuffushi City.

1- Partnership with Suppliers:

Engage local suppliers through MoUs in providing high-quality solar products at competitive prices and incentivising businesses that work in the provision of related services

2- Digital Outreach:

Use council websites and social media to regularly promote solar units, as Norfolk Island did, making it easier for residents to access information about installation processes, costs, and benefits.

3- Community Engagement:

Engage the community through events and public meetings to answer questions about solar energy, as Norfolk Island successfully used community outreach to build trust and participation.





900 trees being planted in Kulhudhuffushi City under "Fini Fehi City" program, on June 2022
Image credit: Kulhudhuffushi Council

Theme 2: Planning

Strategy 6 : Food, Water and Energy Security

Reference to HVCA: Water Security

Action 6.3:

Ensuring Water Security

The wetland areas in Kulhudhuffushi City, particularly its mangroves, present a natural solution for integrated water management. These ecosystems not only assist in flood mitigation but can be optimized to address local water scarcity by reducing reliance on potable water for municipal purposes such as irrigation. Kulhudhuffushi City also houses 4 football fields in recreational plots among other open and public spaces. These plots occupy sufficient land mass whereby the underground space can be utilized for water storage purposes.

By localizing water management strategies to fully utilize the natural hydrological features of the wetlands and the open and recreational spaces, we can introduce sustainable water reuse systems that enhance water security, conserve potable water, and improve overall resilience to water shortages.



Figure 27. Football field on the south side adjacent to wetland water body



Furthermore, to support this proposal, a study titled “Planning and Design of Storm Water Management System for H. Dh. Kulhudhuffushi and G. Dh. Thinadhoo Island” was conducted by the Ministry of Environment and Energy in collaboration with expert consultants in 2013. The study addressed the storm water drainage challenges on Kulhudhuffushi City, offering recommendations such as the use of natural water pathways and improved drainage infrastructure. These findings reinforce the proposed integration of rainwater collection and soak pits to enhance water security and reduce the reliance on potable water (Ministry of Environment and Energy, 2013).



Figure 28. Storm water tank management systems (Ferguson, 2023)

Case study:

The Sydney Park Water Reuse Project provides a similar precedent for Kulhudhuffushi City in addressing water management challenges. In Sydney, storm water is captured, treated, and reused for non-potable purposes such as irrigating public parks and maintaining wetlands. The project integrates bio-retention wetlands and large underground storage systems beneath open spaces to sustainably manage water resources.



Figure 29. Sydney Park Water Reuse Project

This method offers valuable insights for Kulhudhuffushi City, which can similarly utilize its natural wetland areas and recreational spaces, like football fields, to develop integrated water reuse systems. By adopting this approach, Kulhudhuffushi City can reduce its dependency on potable water for municipal uses and increase resilience to water shortages (Landezine, 2020; Builtworks, 2021; Architecture & Design, 2016).

In the context of Kulhudhuffushi:

The location below can be proposed as the site for a pilot project for a multimodal water management system implementation project.

Figure 31 presents a localized water management strategy for the highlighted area zone of Kulhudhuffushi City LUP. It highlights the integration of rainwater collection and surface water runoff management with the island’s natural and built environment.

1- Football Field - Underground Rainwater Collection Storage Tanks:

The football field offers an opportunity to install underground rainwater storage tanks. These tanks will collect runoff from the surrounding areas and the field, ensuring that the harvested rainwater can be reused for non-potable purposes like irrigation and reducing the need for potable water.

2- Open Space - Soak Pits:

In the adjacent open space, soak pits will be used to facilitate groundwater recharge. These soak pits will manage excess surface water runoff by allowing rainwater to slowly percolate into the ground, helping to prevent surface flooding.

3- Surface Water Runoff Drainage Line (Magenta Line):

This drainage line directs excess surface water from the area towards the wetland, ensuring effective management of overflow from the football field or open space while leveraging the natural filtration capabilities of the wetland.

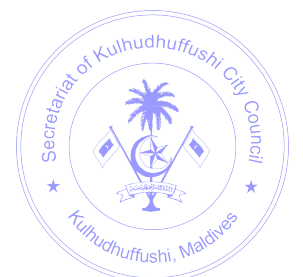




Figure 30. Water management diagram

4- Rainwater and Surface Water Collection (Blue Points):

These areas mark the strategic collection points for rainwater and surface runoff, ensuring sustainable water management across the zone.

5- Excess Water Outlet (Blue Arrows):

The excess water outlet system directs any overflow from the collection systems to prevent water logging and ensure efficient drainage during heavy rainfall.

By integrating these rainwater collection systems, underground storage, and effective runoff management strategies, Kulhudhuffushi City LUP can enhance its water resilience and reduce the demand for potable water in municipal uses like irrigation and public sanitation.

L - 07

Theme 3: Economic & Finance

Strategy 8 : Climate financing

Reference to HVCA: Multi-hazard



Action 8.2:

Micro grants for resilience projects.

This action focuses on providing small-scale financial support for community-led initiatives that enhance climate resilience. The sub-actions involve creating clear guidelines and criteria for community members to apply for micro grants, with a focus on projects that enhance local resilience, such as rainwater harvesting, flood prevention, and sustainable infrastructure. Additionally, partnerships with banks and financial institutions will be established to support the distribution of these grants.

Case Study:

U.S. Chamber of Commerce Foundation's Resilience Program for Small Businesses

The U.S. Chamber of Commerce Foundation's Ready for Resilience (R4R) program is designed to help small businesses (with 500 or fewer employees) prepare for and recover from disasters. In collaboration with the Federal Emergency Management Agency (FEMA), the program provides businesses with a four-step process to strengthen disaster preparedness. This includes completing a preparedness checklist, registering the business, adding the R4R team to contacts, and monitoring FEMA declarations. Eligible businesses, located in areas with a FEMA Individual Assistance declaration, can apply for grants to cover disaster-related losses exceeding \$5,000. However, nonprofits, private clubs, religious institutions, and direct sellers are not eligible for the program.

In the context of Kulhudhuffushi:

This grant model can be localized to Kulhudhuffushi City, considering the specific risks and resilience needs identified in the city's climate adaptation plan. To develop a similar resilience program tailored for local small businesses, we can adapt the program's principles while addressing the unique challenges in Kulhudhuffushi City, including heat-wave, flooding, coastal erosion, and infrastructure vulnerabilities.

Identify Specific Disaster Risks:

The R4R model could focus on preparing businesses for climate-related hazards that are prevalent in Kulhudhuffushi City, such as coastal erosion, flooding, and extreme heat. A local checklist could be created that incorporates these risks, drawing from the HVCA (2024) prepared for this project.

Partner with Local Entities:

Collaborate with local agencies such as the National Disaster Management Authority (NDMA),



and the Ministry of Climate Change, Environment and Energy. Bank of Maldives, other financial institutions such as SME Development Finance Corporation (SDFC), and insurance companies to create a localized preparedness checklist and provide disaster insurance packages and grants for climate change adaptation.

The SDFC currently offers the “Dhanduveri Manfaa Grant,” but since Kulhudhuffushi City is not included in the eligible areas, the Council could engage in discussions with SDFC to explore the possibility of incorporating the island into the grant scheme or developing a smaller-scale grant specifically tailored for the residents of Kulhudhuffushi City. This could also cater for action ‘urban and community farming initiatives’ localized in L- 05, and ‘Green space development activity’ that was suggested under L- 09.

Adaptation Fund/Grant for Small Businesses:

A fund could be set up similar to the R4R grant program to help small businesses to adopt more climate resilience strategies. The eligibility for these funds could include participation in preparedness programs, submission of proposals that support the green initiatives and climate adaptation efforts and submission of a business continuity plan that addresses the identified risks.

L - 08

Theme 4: Social

Strategy 9 : Community Empowerment

Reference to HVCA: Multi hazard

Action 9.1:

Conduct community events and workshops organized to enhance social bonding and resilience.

Community events and workshops will be organized with the dual purpose of strengthening social connections and improving climate resilience knowledge and skills. These activities will be designed in collaboration with community members and relevant stakeholders.

Case study:

Vancouver’s Community Resilience Building Through Grassroots Initiatives

In Vancouver, Canada, the city has launched community-driven events and workshops to boost social bonds and resilience to climate risks such as heatwaves and flooding.



A key initiative during the 2021 heat dome saw neighbors leaving water coolers in public areas for those in need. Neighborhood block parties and events help raise climate awareness through expert talks, social games, BBQs, and emergency preparedness booths. Activities like community mapping identify vulnerable individuals and flood-prone areas for targeted support. Vancouver’s Climate Resilience Workshop Series teaches practical skills to respond to emergencies, including heatwave response, scenario planning, and community farming, with a focus on vulnerable groups.

These efforts foster stronger social connections, reduce isolation, and promote long-term community collaboration through projects like shared gardens and neighborhood watch programs. Inspired by grassroots actions, the city also funds small community-led initiatives such as block parties and public art projects through its Resilience Strategy.



Figure 32. Chilled water provided by neighbors during Vancouver’s 2021 heat dome. Ice coolers with ice and water was left in different places across the neighborhood for whoever might have been in need of it.



Figure 33. Neighbors break ground and gather for a block party to celebrate the installation of an emergency preparedness bench in a residential neighborhood of Vancouver.

Similarly, in the Maldives, traditional celebrations like ‘Maali Neshun’, ‘Koadi Negun’, and ‘Maahefun’ during Ramadan also strengthen community bonds and promote togetherness among neighbors.

In the context of Kulhudhuffushi

1. Event Theme: “Resilience and Adaptation for a Stronger Kulhudhuffushi”

This block party would focus on the community coming together to understand climate risks (such as flooding, storm surges, and environmental degradation) and how everyone can play a role in adapting to these challenges.

2. Activities and Engagement: Traditional Games and Storytelling:

Engage the community with traditional items like Bodu Beru performances and Suvaa kulhun, Ohvalhu gondi combined with storytelling sessions led by elders sharing experiences of past extreme weather events. These stories could highlight how the community has historically adapted to changes in their environment, fostering a connection between generations and reinforcing the idea that adaptation is part of life.

Climate Change Awareness Booths:

Set up interactive booths with local environmental groups or NGOs that provide information about the specific risks Kulhudhuffushi City faces, such as coastal flooding or loss of mangroves. These booths could also offer demonstrations on sustainable practices like waste reduction, rainwater harvesting, and planting.

Emergency Preparedness Training:

Conduct workshops on creating family and community emergency plans based on the emergency plans developed. These could include training on what to do during a storm surge or flood, preparing emergency kits that could be used by children and families, and raising awareness on evacuation routes within the island. This practical

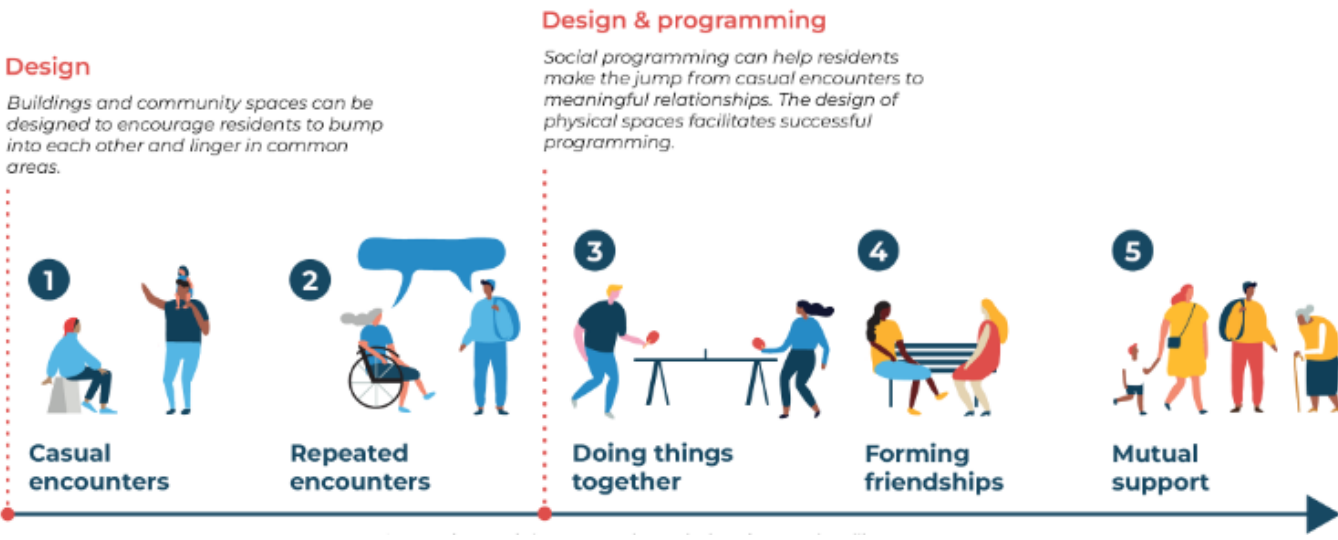


Figure 31. Increasing social connectedness, belonging and resilience



training would help build community resilience.

Interactive Arts and Crafts for Kids:

Children could participate in activities where they create art out of recycled materials, focusing on environmental themes. They could also learn how to grow small vegetable plants, introducing them to climate-friendly food security practices in a fun way.

Local Food and Refreshments:

Incorporate locally sourced and climate-conscious food stalls offering traditional foods produced and made in Kulhudhuffushi City, while promoting a zero-waste approach with reusable cutlery and compostable packaging. This could also involve a competition for the best local climate-friendly dish, raising awareness about sustainable food choices.

Green Space Development:

A community-driven planting event where residents come together to plant trees (refer to Figure 35 for the suggested locations). This could be tied to discussions on how ecosystems play a vital role in protecting the island from erosion and storm surges.

3. Collaborative Efforts:

- Involve schools and NGO's in organizing the event, making sure that it is inclusive and reflects the priorities of the people in Kulhudhuffushi City. This would also create a learning opportunity for children and youth to engage in discussions around climate resilience.
- Local environmental experts or NGOs could lead small workshops on how climate change impacts Kulhudhuffushi City specifically and what practical steps individuals and families can take to adapt. These might include talks on rainwater harvesting, solar power solutions, or coastal barrier projects.

These events could foster a sense of togetherness, encouraging neighbors to support one another during times of crisis, like flooding or heat-waves. Additionally, by highlighting community-based solutions to climate change, the block party could inspire action toward more sustainable living practices, while strengthening social bonds through shared cultural activities and collective problem-solving.



Figure 34. Suggested areas for coastal vegetation, marked in dash orange lines

L - 09

Theme 4: Social

Strategy 10 : Ensuring Health & Well-being in the face of climate risk

Reference to HVCA: Social vulnerabilities

Action 10.2:

Implementation and reach of mental wellbeing programs addressing climate-related stress.

Climate change has lasting impacts on people's mental health and psychosocial well being. Certain groups such as pre-existing health and mental health conditions as well as physical disabilities and other vulnerable groups are affected negatively and disproportionately under the hazards presented with climate change.

The World Health Organization (WHO) recommends five key approaches to address these impacts:

- 1- Integrate climate change considerations into policies and programs for mental health, including MHPSS, to better prepare for and respond to the climate crisis
- 2- Integrate MHPSS within policies and programs dealing with climate change and health
- 3- Build upon global commitments
- 4- Implement multi sectoral and community-based approaches to reduce vulnerabilities and address the mental health and psychosocial impacts of climate change
- 5- Address the large gaps that exist in funding both for mental health and for responding to the health impacts of climate change



Case study:

The case of Bangladesh and New York

In the case of Bangladesh, the Bangladesh Health National Adaptation Plan (HNAP) outlines strategies to mitigate the adverse effects of climate change on the health system, including mental health. Where the focus is on strengthening the collection of data to appraise the effects of climate related disasters on health as well as mental health.

New York City's Building Resilience Against Climate Effects (BRACE) program integrates mental health services into its climate adaptation strategy by addressing the psychological impacts of climate-related disasters like hurricanes and extreme heat. It provides support to affected communities, enhances local health department capabilities through training for mental health professionals and first responders, and conducts research on the health impacts of climate change. Additionally, BRACE collaborates with various organizations to ensure mental health is included in broader climate adaptation efforts, developing resources to identify and assist at-risk populations.



In the context of Kulhudhuffushi

The cases above can be used to develop strategies and programs for Kulhudhuffushi City.

Kulhudhuffushi City Climate Adaptation Programs focusing on mental health

These programs should focus on community outreach and also collection of data through the various NGOs and health institutions.

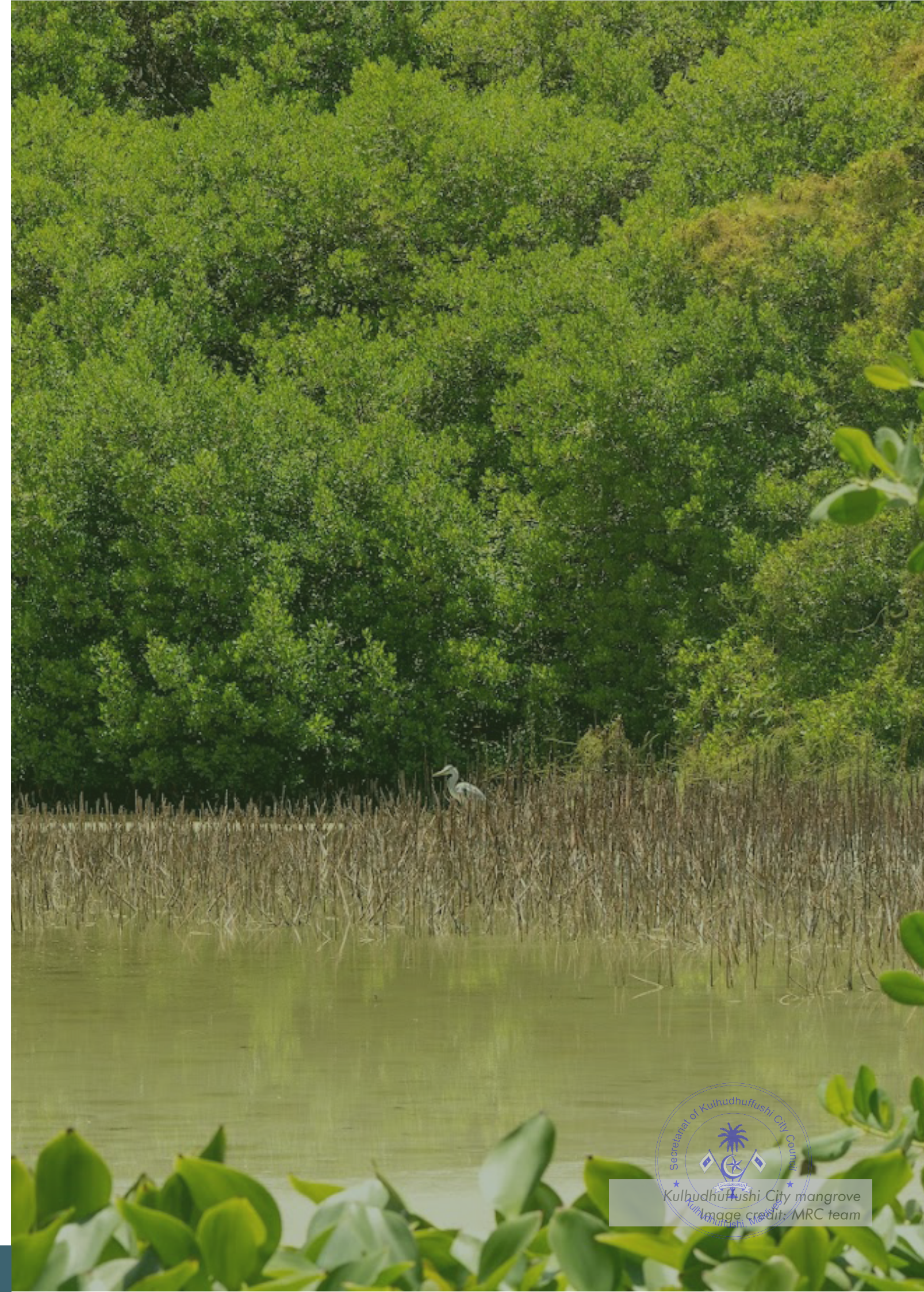
1- Mental Health and Psychosocial support (MHPSS) programs can be formulated and implemented by KCC to train relevant NGO's and retrain humanitarian and disaster management organizations. Further, resources can be allocated for such initiatives.

For example;

a- Supporting MHPSS hot lines with organizations such as the Maldivian Red Crescent or other humanitarian organizations through provision of resources

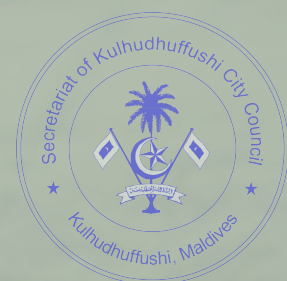
b- First responders and mental health professional training programs can be conducted on a regular basis

2- At the community level - Supporting local NGOs to conduct peer support meetings and conduct community based mental wellbeing programs in terms of resources such as provision of council spaces





A tree planting program under a initiative to make Kulhudhuffushi city more green, 2019
Image credit: Kulhudhuffushi Online








08

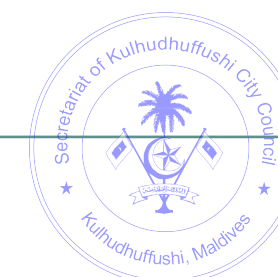
IMPLEMENTATION PLAN

The implementation plan serves as a road map for how the proposed actions and sub-actions can be effectively put into practice in a timely manner. To ensure clarity and organization, the actions have been categorized into three main time frames: short-term (within 2 years), medium-term (within 5 years), and long-term. Additionally, continuous initiatives, which require ongoing efforts, have also been marked. These actions have also been linked to the respective responsible parties, categorized into primary and supporting roles, to ensure accountability and successful execution.



STRATEGY 1 - DEVELOP CLIMATE RESILIENT POLICIES AND PLANS

#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
1.1	Introduce planning and development guidelines to ensure green and sustainable design and development practices.	KCC	Relevant Ministries (Finance, Planning, Cities, Local Government, Public Works, Construction, Housing, Infrastructure Tourism & Environment) Attorney General's Office	 <ul style="list-style-type: none"> • Integrate climate resilient design principles into LUP; define buildable areas (maximum of 80%, 10–15% for open and green spaces) • Establish guidelines with clear parameters for setbacks, ventilation, and energy-efficient building design • Introduce a Floor Space Index (FSI) of 4–5, to encourage vertical development • Zone flood-prone areas directly in LUP • Include a clause requiring critical buildings to be elevated 350mm–550mm, from NGL 		
				 <ul style="list-style-type: none"> • Approval of new developments based on the incorporation of flood protection measures and adherence to elevation guidelines • Ensure all new buildings in flood-prone zones are elevated by 350mm–550mm from NGL 		
1.2	Integrate climate resilience into existing policies and regulations.	KCC	Relevant Ministries (Finance, Planning, Cities, Local Government, Public Works, Construction, Housing, Infrastructure Tourism & Environment) Attorney General's Office	 <ul style="list-style-type: none"> • Review and revise all the existing policies within the jurisdiction to incorporate climate resilient measures. 		
1.3	Promote inclusive policies that address gender and social inequalities in efforts to reduce the negative impacts of climate change.	KCC	Relevant Ministries (Social, Family Development) Relevant NGOs	 <ul style="list-style-type: none"> • Conduct gender and social impact assessments before project implementation • Ensure plans and policies address gender and social inequalities to promote equitable climate resilience outcomes 		
1.4	Create a strong framework for preserving the existing mangroves and wetlands on the island.	KCC	Relevant Ministries (Tourism & Environment)	 <ul style="list-style-type: none"> • Conduct assessments to identify priority areas for mangrove and wetland conservation • Develop tailored management plans for long-term sustainability • Organize community mangrove restoration projects and reforest degraded areas with native species. 		



STRATEGY 2 - RESOURCE MANAGEMENT & CONSENSUS BUILDING

#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
2.1	Allocate a climate fund within the council budget	KCC	-	<div><div></div><div><ul style="list-style-type: none">• Conduct a needs assessment to identify priority areas for climate adaptation and mitigation funding• Develop a budget proposal outlining short-term and long-term climate goals and associated costs• Establish a climate fund within the council's structure for transparent tracking and reporting of climate expenses</div></div>		
2.2	Collaboration with other countries, universities, and research institutions for knowledge sharing	KCC	International organizations Relevant Ministries (Foreign Affairs) MNU and other research institutions	<div><div></div><div><ul style="list-style-type: none">• Collaborate with other city councils in different countries, for exchange of ideas and best practices• Develop formal MoUs with international research institutions to exchange data and findings on climate adaptation• Encourage collaborative research on climate risks and responses, specific to Kulhudhuffushi City.• Promote environmental courses conducted in Kulhudhuffushi to incorporate local context into their modules and research components</div></div>		
2.3	Partner with waste management service providers to establish a safe, resilient waste management system	KCC	WAMCO Relevant Ministries (Tourism & Environment)	<div><div></div><div><ul style="list-style-type: none">• Partner with waste management providers to ensure safe collection, transport, and disposal of medical waste• Partner with waste management providers to educate locals on waste segregation, through campaigns and workshops</div></div>		



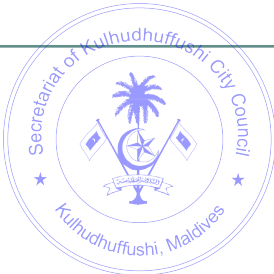
STRATEGY 3 - UP-TO-DATE INFORMATION COLLECTION AND DISSEMINATION




#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
3.1	Collect data to set up a data hub	KCC	MNU Airport Maldives Meteorological Service Relevant Ministries (Tourism & Environment)	<div><div></div><div></div><div></div></div> <ul style="list-style-type: none">Establish a data hubIntegrate existing climate and environmental data sources including data from EPA, MET office, MNU, Charrette and local researchesCollection of climate and environmental data locally; obtain necessary equipment and digital sensors to regularly measure set parameters		
3.2	Adopt data analysis and visualization tools	KCC	-	<div><div></div><div></div><div></div></div> <ul style="list-style-type: none">Set up climate change data collection and visualization capabilities within KCC, including GIS training for personnel		
3.3	Data dissemination	KCC	-	<div><div></div><div></div><div></div></div> <ul style="list-style-type: none">Create a shared digital platform for stakeholders to share real-time updates on climate resilience projects and risksPublish quarterly data reports on a dashboard or messaging platforms to update stakeholders on climate conditions and resilience efforts		



STRATEGY 4 - SUSTAINABLE URBAN PLANNING



#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
4.1	Ensure the integration and preservation of green and open spaces	KCC	Relevant Ministries (Finance, Planning, Cities, Local Government, Public Works, Construction, Housing, Infrastructure, Tourism & Environment) Attorney General's Office	<div><div></div></div> <ul style="list-style-type: none">Allocate 10 - 15% of land for green and open spaces in the planning guidelines and the LUPEnsure green spaces are easily accessible within walking distance of residential areas	<div><div></div></div> <ul style="list-style-type: none">Preserve existing green and open spaces by restricting permanent structuresDesignate and protect green spaces in the LUP as no-build zones	<div><div></div></div> <ul style="list-style-type: none">Promote green spaces in residential developments by encouraging developers to incorporate parks and open areas
4.2	Rejuvenate the green buffer (heylhifah) around the island	KCC	Relevant Ministries (Finance, Planning, Cities, Local Government, Public Works, Construction, Housing, Infrastructure, Tourism & Environment) Attorney General's Office	<div><div></div></div> <ul style="list-style-type: none">Map EPZs and repurpose built spaces within the green buffer for restoration	<div><div></div></div> <ul style="list-style-type: none">Replant trees to reclaim a 20-meter green buffer around the island	
4.3	Adopt the Sponge City Concept	KCC	Road Development Corporation (RDC)	<div><div></div></div> <ul style="list-style-type: none">Designate vacant lots and large parks for water drainage using permeable surfacesEnsure adequate drainage systems in undeveloped areas through expert assessmentsIntroduce road side greenery as a natural drainage		

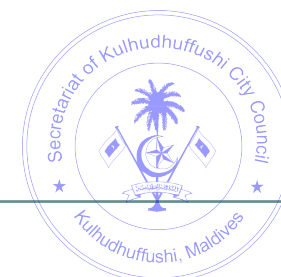


4.4	Establish and enhance the city's waste management system	KCC, WAMCO	Relevant Ministries (Tourism, Environment & Health) Kulhudhuffushi Regional Hospital (KRH) Relevant NGOs	 <ul style="list-style-type: none"> • Introduce composting programs and provide training to residents • Implement a proper medical waste disposal system to prevent health hazards
				 <ul style="list-style-type: none"> • Improve waste collection, segregation, and disposal systems in collaboration with WAMCO • Encourage community recycling and waste reduction through education and initiatives • Promote jumble sales and second-hand markets to promote recycling and waste reduction • Develop and promote innovative waste-to-resource solutions focusing on compost or fertilizer production from organic waste and recovery of recyclable materials.
4.5	Review and update of plans	KCC	Relevant Ministries (Planning and development)	 <ul style="list-style-type: none"> • Revision updating of LUP, and other development and guiding documents according to their set time-frames

Theme 2 - Planning

STRATEGY 5 - RESILIENT INFRASTRUCTURE

#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
5.1	Develop canopies to combat heat	KCC	-	 <ul style="list-style-type: none"> • Introduce natural and artificial shade in public, high-traffic areas 		
5.2	Ensure critical buildings are located away from disaster-prone areas	KCC	Fenaka Corporation Limited Malé Water & Sewerage Company (MWSC) Dhiraagu Ooredoo Relevant Ministries (Higher Education, Labour, Skills Development & Health) Kulhudhuffushi Regional Hospital (KRH) Family and Children Service Center (FCSC) other relevant authorities	 <ul style="list-style-type: none"> • Plan critical infrastructures of the city away from the flood prone areas identified in the city hazard maps 		



5.3	Introduce alternative transportation modes to reduce vehicular emissions.	KCC	Relevant Ministries (Transport & Civil Aviation) Maldives Transport and Contracting Company Plc. (MTCC)	 <ul style="list-style-type: none"> • Expand bus routes to improve public transportation access and reduce reliance on private vehicles • Introduce bike lanes along major roads <hr/>  <ul style="list-style-type: none"> • Designate pedestrian-only streets during weekends • Promote e-bikes and e-scooters as eco-friendly alternatives through awareness campaigns
5.4	Implement coastal solutions to minimize coastal erosion and flooding due to sea level rise.	KCC	Relevant Ministries (Tourism, Environment, Construction, Housing & Infrastructure)	 <ul style="list-style-type: none"> • Conduct studies to identify effective coastal protection measures to guide decision-making on the best solutions • Construct and maintain coastal protection for the eastern coastline
5.5	Promote the use of green buildings	KCC	Relevant Ministries (Tourism, Environment, Construction, Housing & Infrastructure)	 <ul style="list-style-type: none"> • Educate the community and developers on sustainable building design principles and energy-efficient designs • Introducing a recognized green rating system (e.g., EDGE or BREEAM) to set measurable sustainability standards for buildings • Launch a pilot project to encourage and showcase innovative green building features
5.6	Coastal habitat restoration and protection	KCC	Relevant Ministries (Tourism, Environment, Construction, Housing & Infrastructure)	 <ul style="list-style-type: none"> • Integrate artificial reefs with natural mangrove ecosystems for enhanced coastal protection
5.7	Climate proof all critical infrastructure	KCC	Relevant Ministries (Finance, Planning, Cities, Local Government, Public Works, Construction, Housing, Infrastructure, Tourism, Environment & Health)	 <ul style="list-style-type: none"> • Elevate critical machinery to protect vital equipment from flooding and storm surges • Retrofit essential infrastructures to withstand extreme weather and improve climate resilience

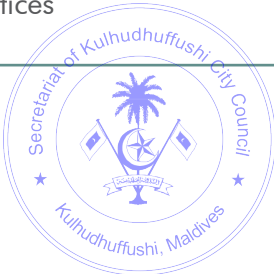


Kulhudhuffushi City mangrove
Image credit: MRC team



STRATEGY 6 - FOOD, WATER, AND ENERGY SECURITY

#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
6.1	Ensuring food security	KCC	Relevant Ministries (Agriculture, Animal Welfare, Tourism, Environment, Economic Development & Trade)	<div><div></div><div>• Allocate land to increase warehousing capacity, considering regional storage needs for government and businesses</div></div>		
				<div><div></div><div>• Develop, approve, and implement a comprehensive food security emergency plan to ensure a reliable food supply</div></div>		
				<div><div></div><div>• Promote urban and community farming initiatives to achieve self-sufficiency</div><div>• Develop and implement training programs for climate-resilient agricultural practices, while providing technical support to farmers</div></div>		
6.2	Ensuring energy security	KCC	Relevant Ministries (Environment & Energy) Banks Fenaka Corporation Limited Utility Regulatory Authority (URA)	<div><div></div><div>• Promote topic-related activities by providing community halls for awareness sessions and actively running campaigns on social media.</div><div>• Provide incentives and financing options for households and small businesses to invest in renewable energy</div><div>• Mandate energy efficiency standards for new buildings, appliances, and industrial equipment</div><div>• Provide incentives for retrofitting old buildings with energy-efficient technologies</div></div>		
				<div><div></div><div>• Promote solar units for households and small businesses</div><div>• Conduct public awareness campaigns on energy-saving practices</div></div>		






6.3	Ensuring water security	KCC	Relevant Ministries (Planning, Construction & Infrastructure) Malé Water & Sewerage Company (MWSC) Road Development Corporation (RDC)	<div>→</div> <ul style="list-style-type: none"> • Assess groundwater resources and explore engineering solutions to ensure long-term water availability • Implement groundwater nourishment infrastructure at all institutions, residential, and communal areas • Design new roadsides with efficient drainage systems to prevent waterlogging and direct stormwater to catchment areas • Create space for water storage capacity in public and community buildings via planning and development guidelines to ensure adequate water availability during emergencies. <ul style="list-style-type: none"> • Design parks and public spaces to allocate space for underground water tanks • Incentivize and subsidize water security and capacity in new buildings to encourage the inclusion of water-saving technologies
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Theme 3 - Economic & Finance


STRATEGY 7 - ECONOMIC DEVELOPMENT TO FIGHT AGAINST CLIMATE CHANGE

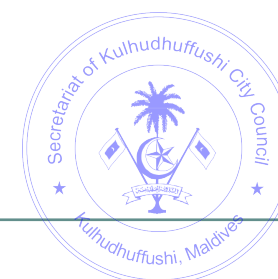
#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
7.1	Develop alternative income-generating activities (solar-powered livelihood programs) for vulnerable communities	KCC	Business Center Corporation (BCC) SME Development Finance Corporation Private Limited (SDFC) Banks	<div>→</div> <ul style="list-style-type: none"> • Encourage vulnerable groups with solar-powered equipment for small-scale enterprises 		
7.2	Promote eco-tourism as a sustainable tourism product	KCC	Relevant Ministries (Tourism & Environment) Maldives Marketing & Public Relations Corporation (MMPRC) Maldives Association of Tourism Industry (MATI) Maldives Association of Travel Agents and Tour Operators (MATATO) Maldivian/ Island Aviation Services Ltd	<div>→</div> <ul style="list-style-type: none"> • Develop a sustainability-focused branding strategy for the city • Establish eco-tourism guidelines under related campaigns • Implement a scoring system to incentivize eco-friendly tourism businesses 		

7.3	Introduce programs to help small businesses enhance their resilience	KCC	Business Center Corporation (BCC) SME Development Finance Corporation Private Limited (SDFC) Banks Donor agencies Relevant NGOs	 <ul style="list-style-type: none"> • Organize workshops for business owners to identify climate-related risks and prepare for them • Conduct training for business owners and staff on emergency preparedness, continuity strategies, and recovery after disruptions
7.4	Implement a Green Business Certification program	KCC	Relevant Ministries (Tourism & Environment) Environmental Protection Agency (EPA)	 <ul style="list-style-type: none"> • Develop a certification program for businesses adopting eco-friendly and climate-resilient practices
7.5	Plan and execute climate-change related community projects in collaboration with NGOs that are adaptable to climate change	KCC	Relevant NGOs/CSOs Relevant Ministries (Youth Empowerment, Information & Arts)	 <ul style="list-style-type: none"> • Secure funding and collaborate with suitable NGOs, CSOs, or small businesses to implement climate-change related community projects • Conduct regular progress assessments to monitor implementation and ensure alignment with climate resilience goals

Theme 3 - Economic & Finance

STRATEGY 8 - CLIMATE FINANCING



#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
8.1	Introduce programs for green financing for households and small businesses	KCC	Banks Donor agencies Fenaka Corporation Limited Malé Water & Sewerage Company (MWSC)	 <ul style="list-style-type: none"> • Partner with local banks and financial institutions to develop affordable loan schemes for solar unit installation • Design programs where the council co-finances or guarantees a portion of renewable energy adoption costs for low-income households or small businesses • Create awareness campaigns to inform households and small businesses about green financing options and the benefits of solar energy 		




8.2	Micro grants for resilience projects	KCC	Banks Donor agencies	<div>  <ul style="list-style-type: none"> • Partner with financial institutions to provide micro grants for community-led projects • Develop grant application guidelines for community-led resilience initiatives, to ensure transparency and accessibility of the process </div>
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Theme 4 - Social

STRATEGY 9 - COMMUNITY EMPOWERMENT

#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
9.1	Conduct community events and workshops to enhance social bonding and resilience	KCC	Relevant NGOs Relevant Ministries (Youth Empowerment, Information & Arts)	<div>  <ul style="list-style-type: none"> • Identify key community leaders, groups, and stakeholders to co-design events • Partner with local NGOs focused on climate change, disaster risk management, and social development to organize awareness campaigns on climate resilience and practical adaptation strategies • Develop event themes around disaster preparedness, community farming, and neighborhood-level climate action <ul style="list-style-type: none"> • Conduct interactive workshops with scenario planning and role-playing to enhance community preparedness for climate risks • Establish a monitoring and evaluation framework to track the impact of the sustainability events and training programs • Implement follow-ups and retention initiatives to maintain an active community network </div>		
9.2	Promote cultural heritage preservation as part of resilience efforts and facilitate intergenerational knowledge exchange on climate adaptation	KCC	Relevant Ministries (Dhivehi Language, Culture and Heritage, Youth, Empowerment, Information & Arts) Relevant NGOs	<div>  <ul style="list-style-type: none"> • Organize storytelling events where elders share traditional environmental conservation practices to foster community identity and climate responsibility • Document and promote climate-friendly traditional knowledge by collaborating with cultural institutions, museums, and educational groups </div>		



9.3	Integrate climate change education into school outreach activities	KCC	Relevant Ministries (Education, Labour and Skills Development, Tourism & Environment)	<div data-bbox="1546 142 2362 170" data-label="Text">  </div> <ul style="list-style-type: none"> Align MNU's environment and climate courses with the council's environmental initiatives Facilitate opportunities for local students to enroll in climate-related courses offered at MNU's main campus and other education institutions
				<div data-bbox="1546 489 2783 516" data-label="Text">  </div> <ul style="list-style-type: none"> Implement hands-on school initiatives like farming, recycling, and composting to engage students in sustainable practices
9.4	Implement training programs for emergency response and disaster preparedness, focusing on vulnerable groups as outlined in the DMP	KCC	National Disaster Management Authority (NDMA) Maldives National Defence Force (MNDF) Relevant Ministries (Social and Family Development) Relevant NGOs	<div data-bbox="1528 720 1911 747" data-label="Text">  </div> <ul style="list-style-type: none"> Conduct community risk assessments using HVCA (2024) findings to identify vulnerable groups and tailor training programs accordingly Organize targeted emergency response training in accessible locations for vulnerable populations, ensuring relevance and inclusivity Develop training materials in multiple languages and formats to ensure broad accessibility and inclusivity Integrate simulation exercises and real-time disaster response drills into training to enhance emergency preparedness

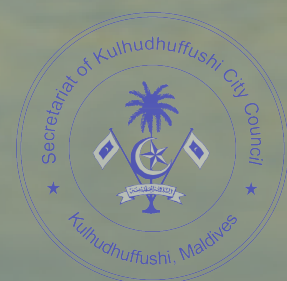
STRATEGY 10 - ENSURING HEALTH & WELL-BEING IN THE FACE OF CLIMATE RISK

#	ACTION	RESPONSIBLE PARTIES		IMPLEMENTATION PERIOD		
		PRIMARY	SUPPORTING	WITHIN 2 YEARS	WITHIN 5 YEARS	LONG TERM
10.1	Conduct outreach activities targeting vulnerable populations during extreme weather events	KCC	National Disaster Management Authority (NDMA) Maldives Meteorological Service Relevant Ministires (Social and Family Development, Health) Relevant NGOs Maldivian Red Crescent (MRC) Kulhudhuffushi Regional Hospital (KRH)\	<div><div></div><div><ul style="list-style-type: none">Recruit and train volunteers to check on vulnerable individuals during extreme weather events through various means, to ensure their safety and well-beingCollaborate with the regional hospital to provide educational workshops and regularly updated informational materials on climate-related safety practices</div><div></div></div>		
10.2	Implement mental wellbeing programs to address climate-related stress	KCC	Kulhudhuffushi Regional Hospital (KRH) Mental wellbeing center (in IGMH) Maldivian Red Crescent (MRC) Relevant NGOs Relevant Ministries (Health)	<div><div></div><div><ul style="list-style-type: none">Establish a local hotline to connect residents with mental health professionals for support during extreme weather and environmental changesOrganize support group sessions in schools, in partnership with mental health professionals, to address climate anxiety and promote stress management strategiesConnect vulnerable individuals with online mental health consultations and resources to provide accessible and immediate support during crises</div><div></div></div>		
10.3	Ensure the provision of adequately trained professionals in health and relevant disciplines to respond to climate-sensitive health risks	KCC	Kulhudhuffushi Regional Hospital (KRH) Mental wellbeing center (in IGMH) Relevant NGOs Relevant Ministries (Health)	<div><div></div><div><ul style="list-style-type: none">Collaborate with educational institutions to develop certification programs for students and health professionals on managing climate-sensitive health risks</div><div></div></div>		





Migratory flamingos at Kulhudhuffushi mangrove, 2021
Image credit: Jaufar Ali



09

CONCLUSION

In conclusion, CCAP's proposed strategies and actions target the identified climate-related hazards from the HVCA (2024) and the identified gaps that threaten the city's ability to adapt to climate risks. The plan builds upon the HVCA (2024) findings, including gaps such as the limited availability of data on various hazards, particularly at the Kulhudhuffushi City level, and low public awareness of environmental issues, hazards, and their impacts, particularly at the citizen level. Additionally, the plan identifies a lack of trained personnel and appropriate equipment in key areas, insufficient climate-resilient infrastructure, poor cross-sectoral coordination, weak community bonds, and overall low preparedness within the community to handle climate emergencies. The strategies outlined in the CCAP, organized under the four key themes, are a crucial step toward ensuring adaptability and readiness for current and future climate impacts. The current plan is set for a five-year period, followed by monitoring and evaluation, allowing for necessary adjustments to be made for future use.

Ultimately, the successful implementation of these actions requires proactive and collaborative efforts between the community and managing bodies. Timely action based on the localized and suggested strategies is essential to adapting to the identified hazards, closing the gaps identified in the HVCA (2024), and safeguarding the long-term well-being of Kulhudhuffushi City's residents against the escalating threats of climate change. Through this CCAP, the city has a robust plan to guide its adaptation efforts and serve as a framework to align other initiatives, to foster a coordinated approach to adapting to climate change and enhancing overall resilience.



A flooded road of Kulhudhuffushi City, 2025
Image credit: Charrette team

10

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11

APPENDICES

11.1 Implementation plan excel sheet



View from Kulhudhuffushi City's mangrove
Image credit: Charrette team



Kulhudhuffushi City Council
August 2025

