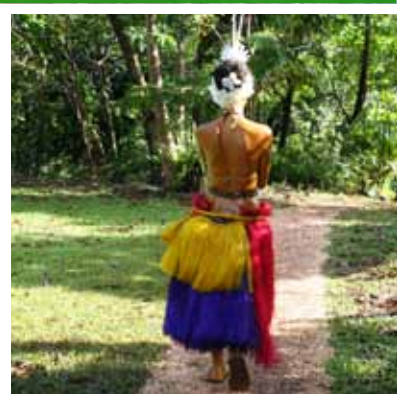


# Palau Climate Change Policy

For Climate and  
Disaster Resilient  
Low Emissions  
Development

2015



## Government of Palau



SPC  
Secretariat  
of the Pacific  
Community



**giz**



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The contents of the policy in no way reflect the views of the above listed development partners.



H.E. Tommy Remengesau, President of Palau, with members of the Ad-Hoc Climate Change Committee © Office of the President.  
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### **Message from His Excellency Tommy E. Remengesau, Jr.** **President of the Republic of Palau**

As an island nation, we are literally in the frontlines of climate change. Never before in the history of our islands and humanity have we faced a bigger and more universal threat. Climate change has negatively impacted our resources, infrastructure, and livelihoods – not once, but several times in recent years. Our continuity and future existence as a people are now at the mercy of climate change. As with all other threats we've faced in the past, we choose to tackle climate change the same way – by working together. We have made a significant step in this direction by developing this Palau Climate Change Policy and Action Plan for Climate & Disaster Resilient Low Emission Development, which focuses on ten sectors. Putting this Policy together involved many stakeholders from multiple levels of government and the private sector, and was a truly participatory and inclusive process. This effort was guided by the Climate Change Ad Hoc Committee of the National Environmental Protection Council (NEPC) and supported by various international, regional, and local partners.

I am proud that we have completed this important national Policy and taken such a proactive approach to tackling climate change. However, this Policy will only be useful and successful if it is implemented well. As we adopt its priorities and carry out its interventions, the same inclusiveness, cooperation, and diversity of participation that went into its development must be repeated. The government cannot, and should not, do this alone if we aim to survive. Our vulnerability as a small island nation can be overcome by our strong and diverse capacities.

I thank everyone for the tremendous effort invested into developing this Policy and I look forward to working with you to implement it. Together we will ensure a strong and secure future, even in the face of a changing world.



Tommy E. Remengesau, Jr.  
President of the Republic of Palau



# Acronyms

BoBP	Bureau of Budget & Planning
CO <sub>2</sub>	Carbon Dioxide
DRR	Disaster Risk Reduction
EIA	Environmental Impact Assessment
FGC ANZEC	New Zealand based international development consulting firm
GDP	Gross Domestic Product
GHG	Greenhouse gas
INDC	Intended National Determined Contributions
IPCC	Inter-Governmental Panel on Climate Change
IPP	Independent power producer
JNAP	Joint National Action Plan
LEAP	Local Early Action Plan
LED	Light-emitting Diode
LEDS	Low-Emission Development Strategies and Plans
NAMA	National Appropriate Mitigation Actions
NAP	National Adaptation Plan
NCD	Non-communicable disease
NDRMF	National Disaster Risk Management Framework
NEC	National Energy Committee
NEE	National Executing Entity
NEMO	National Emergency Management Office
NEP	National Energy Policy
OERC	Office of Environmental Response and Coordination
PAN	Protected Areas Network
PPUC	Palau Public Utilities Corporation
SLM	Sustainable Land Management
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

# Table of Contents

## Palau Climate Change Policy

6	Executive Summary
<b>Section 1 – Introduction</b>	
8	Context
8	Vision and Objectives
10	Principles and Process
12	Evidence and Impacts
<b>Section 2 – Climate Change Adaptation</b>	
14	Risk and Existing Activities
16	Strategic Priorities
<b>Section 3 – Disaster Risk Management</b>	
18	Risks and Existing Activities
20	Strategic Priorities
<b>Section 4 – Mitigation and Low Emission Development</b>	
22	Background
24	Strategic Priorities
<b>Section 5 – Institutional Mechanisms for Effective Policy Implementation</b>	
26	Background and Strategic Priorities
29	Monitoring and Evaluation
<b>Section 6 – Financing Needs for Policy Implementation</b>	
30	Indicative Budget and Financing Plan
<b>Annexes</b>	
33	Acronyms used in the Annexes
34	Annex 1. Costed Action Plan (Section A through P)
48	Annex 2. References
50	Annex 3. Background and Process to develop the Policy
51	Annex 4. Causes and Mechanisms of Climate Change
55	Annex 5. Elaboration of certain sector risks from climate change impacts and disasters



# Executive Summary

Climate Change is one of the greatest challenges ever to face the world and the island nation of Palau. Caused primarily by greenhouse gas emissions from fossil fuel energy consumption, current changes to climate are being driven by a global temperature rise of at least 0.6°C since pre-industrial times. Climate is expected to change more. Small Island States such as Palau have called for a lower limit of below 1.5°C and many industrialized countries have agreed to limit the rise in temperature to 2.0°C.

Palau, with its long history of close ties to its natural environment, is already feeling the acute impacts of climate change. Communities and researchers have confirmed impacts and risks such as rising sea levels and increased incidences of extreme weather. Palau, in proactively preparing for the expected changes in climate, as well as anticipating the unexpected such as disasters, has developed this Palau Climate Change Policy and Action Plan for Climate & Disaster Resilient Low Emission Development. This Policy outlines Palau's strategic priorities for adapting to impacts of climate change, preparing for and responding to disasters, and contributing to global efforts to reduce greenhouse gas emissions. Because climate change and disasters – whether directly caused by or exacerbated by climate change – affect all parts of society, this Policy addresses multiple sectors as well.

The vision of this Policy is “Happy, healthy, sustainable and resilient Palauan communities in a changing world,” or “A Belau a kldmokl, mesisiich, moduades, e klekar.” To make this vision a reality, this Policy lays out objectives to 1) enhance adaptation and resilience, 2) manage disasters and minimize disaster risk, and 3) mitigate global climate change by working towards low emission development. This Policy establishes a single integrated Government Policy with intervention

and financing priorities. This Policy was developed through a 2-year participatory process. It addresses ten sectors (Agriculture and Fisheries, Health, Finance/Commerce/Economic Development, Biodiversity/Conservation/Natural Resources, Critical Infrastructure, Utilities, Society and Culture; Good Governance, Education, Tourism) and advises on both government and non-government action.

In Palau, direct impacts from climate change are expected to include sea level rise, more extreme weather events, changes in seasonal rainfall, temperature regime changes, and increasing ocean acidification. These direct impacts will have indirect and cumulative impacts on natural and human systems (including human health), and on Palau's economy. Each sector is at risk of indirect and exacerbated impacts from climate change. This Policy identifies the top three risks per sector and then identifies the Government's priority interventions for addressing those top risks. Priorities are based on both need and on the existing adaptation activities already in place in country. The goal of these priority interventions is to build climate resilience within ecosystems, the economy, and society.

Beyond the expected impacts of climate change are unexpected events such as disasters. Disasters may be natural or human-induced. As global and local climate regimes change, many disasters are expected to worsen, either caused or exacerbated by climate change. Thus, this Policy takes a proactive approach to preparing for disasters and reducing disaster risk. This Policy identifies the level of risk for possible disasters and then identifies the Government's priority interventions for addressing those risks, both in terms of preparedness and risk reduction. The goal of these priority interventions is to build safe, resilient, and disaster-prepared communities.



Driftwood © Levent Konuk/Shutterstock

# **“NO CHALLENGE – NO CHALLENGE – POSES A GREATER THREAT TO FUTURE GENERATIONS THAN CLIMATE CHANGE.”**

**USA PRESIDENT BARACK OBAMA  
STATE OF THE UNION ADDRESS  
20<sup>TH</sup> JANUARY 2015**

Climate change is caused by the release of global greenhouse gasses, such as carbon dioxide, from their stored forms on earth in fossil fuels and biomass. Although Palau is small, the per capita emission rate is one of the highest in the world. Palau, like other countries who are signatory to the United Nations Framework Convention on Climate Change (UNFCCC), has agreed to reduce its greenhouse gas emissions. This Policy builds on existing efforts in Palau to protect carbon sinks, improve energy efficiency, and increase low emission development such as investments in renewable energy. It identifies the Government's priority interventions for mitigating the causes of climate change and expanding low emission development. The Mitigation and Low Emission Development section of this Policy is primarily focused on the energy sector, although there are overlaps among interventions for adaptation and disaster risk management. The goal of these interventions is to sustainably manage carbon sinks and reduce national greenhouse gas emissions by at least 20% by 2005. This Policy builds on existing commitments to increase renewable energy contributions by 20% and decrease electrical energy consumption by 30% by 2020.

To achieve the vision and objectives of this Policy, stakeholders in Palau identified needs to improve governance and the institutional mechanisms necessary for effective Policy implementation. This Policy identifies existing gaps in governance, namely limited resourcing (human, technical, and financial), the lack of a centralized Climate

Change Office, and an inefficient legal and institutional framework. It identifies priority interventions for adopting and improving the institutional framework (including a new government organizational chart), and for creating and empowering a Climate Change Office.

The priority interventions for each objective have been made actionable with a 5-year Action Plan. The Action Plan outlines the activities needed for each intervention, and includes stakeholders, timeframes, and resourcing needs, including cost projections. The 5-year Action Plan is intended to be evaluated on an ongoing basis.

The costs of the priority interventions as captured in the 5-year Action Plan is expected to be around US\$476 million for the first five years. These costs are indicative of the scale of costs for both government actions and sector priorities. The Government of Palau will explore both domestic and international financing arrangements.

By establishing this Policy, Palau is taking necessary steps to make its own National plans a reality and meet its obligations under the UNFCCC and other regional and international agreements. More importantly, though, by following the priorities in this Policy, Palau's government and sector leaders will contribute to a global effort to minimize the impacts of climate change, and will build a more resilient and prepared nation that can thrive even in a changing world.

# Introduction | Context and Objectives



## Global Context

Climate change is the greatest challenge facing humankind, according to leaders from the United Nations and nations across the globe. A 2015 Global Risks Report by The World Economic Forum identified climate-related issues, particularly extreme weather and failure to adapt to climate change, among the top global risks the world will face in the next ten years, both in likelihood and impact. Industrialised and developing countries have agreed, under the United Nations Framework Convention on Climate Change (UNFCCC), to reduce global greenhouse gas (GHG) emissions to levels that will limit the global rise in temperature to 2°C (3.6°F), thus minimizing the most dangerous impacts from climate change. To reach this global temperature goal, the United States and China, the world's leading sources of GHG emissions, have agreed to a scale of GHG reductions that ranges from 20% to 28%. Islands around the world, already suffering from the negative consequences of the current global temperature rise of 0.6°C (1.1°F) and associated shifts in climate, have called for even greater GHG reductions. The Alliance of Small Island States, of which Palau is a member, has called to limit the temperature rise to below 1.5°C (2.7°F). In adopting this Palau Climate Change Policy and Action Plan for Climate & Disaster Resilient Low Emission Development (hereafter referred to as this Policy), Palau is joining the world in addressing both the causes of climate change and its impacts and risks on daily life and during disasters.



## Country Context

The people of Palau, closely tied to and reliant on their natural resources and environment, have been increasingly concerned about the changes they are experiencing, from storms to rising seas to disasters that worsen with time. Community concerns have been reinforced by scientific findings from local research institutions such as the Palau International Coral Reef Center (PICRC) and global groups such as the Intergovernmental Panel on Climate Change (IPCC), showing real and immediate impacts, risks, and vulnerabilities – in both daily life and during disasters – from climate change.

Palau is a leader among Small Island Developing States in taking action to preserve its natural resources and improve the quality of life for its people. This Policy is part of Palau's proactive effort to protect itself from the expected impacts of climate change and the unexpected – but anticipated – risks of worsening disasters. It is also part of Palau's contribution to global efforts to reduce GHG emissions and mitigate climate change. Using the best available information, from traditional knowledge to local and international research on effective responses, this Policy furthers efforts towards achieving the strategic vision of Palau's National Master Development Plan to “Substantially enhance the quality of life of Palauans and future generations of Palauans.”

Top: Napoleon Wrasse © Frantisek Hojdysz/Shutterstock.  
Bottom: Flower © Holm & Kitalong and PCS.



The impacts from climate change affect every sector and every level of society and government, as do the risks from and consequences of disasters, whether caused directly by or exacerbated in some way by climate change. Similarly, the responses to climate change and disasters cut across every sector. There is overlap among the impacts, risks, and responses to climate change, disasters, and mitigation. Thus, this Policy serves the purpose of reducing Palau's vulnerability to climate change by enhancing national coordination in addressing new and additional challenges posed by climate change and its wide-reaching impacts.

This Policy also demonstrates solidarity with global and regional efforts to manage the causes and impacts of climate change. By developing and implementing this Policy, Palau is keeping its commitments to the UNFCCC, the Pacific Islands Framework for Action on Climate Change 2006-2015, the Pacific Disaster Risk Reduction and Disaster Management Framework for Action 2005–2015, the Hyogo Framework for Action 2005–2015, Sendai Framework for Disaster Risk Reduction 2015-2030, and the Pacific Island Forum-mandated Regional Strategy for Climate and Disaster Resilient Development in the Pacific. It establishes this Policy's framework that will guide and inform action in accordance with Palau's Medium Term Development Strategy - Action for Palau's Future 2009–2014 and the National Master Development Plan – Palau 2020.

### **Policy Objectives**

The main objective of this Policy is to build the resilience of Palau to climate change and disasters. Additional sub-objectives of the Palau Climate Change Policy are to:

- Enhance adaptation and resilience to the expected impacts of global climate change across all sectors,
- Improve Palau's ability to manage unexpected disasters and minimize disaster risk, and
- Mitigate global climate change by working towards low carbon emission development, maximizing energy efficiency, protecting carbon sinks, and minimizing greenhouse gas emissions.

This Policy establishes, at the highest political level, a single integrated Government Policy with priorities and interventions to establish appropriate institutional frameworks and guide and inform actions that will meet the stated objectives. This Policy articulates Palau's priority interventions on climate change across all sectors, at all levels (community, state, national and international). This Policy informs national budgeting and government spending in relation to climate change and in synergy with ongoing economic development and environmental and climate change initiatives.

This Policy and Action Plan forms the basis for Palau's National Adaptation Plan (NAP) and National Appropriate Mitigation Actions (NAMA) and Intended Nationally Determined Contributions (INDC) that will also inform and facilitate access to international climate change financing under the UNFCCC's Green Climate Fund and Adaptation Fund.

## **POLICY VISION**

**Happy, healthy,  
sustainable  
and resilient  
Palauan  
communities  
in a changing  
world**

**“A Belau a  
kldmokl,  
mesisiich,  
moduades,  
e klekar”**

# Introduction | Principles and Process

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## Organization of This Policy

This Policy is organized around each sub-objective. Section 1 introduces this Policy, including its Vision and Objectives. Section 2 addresses the inevitable expected changes to climate by encouraging proactive adaptation. Section 3 addresses the unexpected – whether directly caused by or simply exacerbated by climate change – by institutionalizing preparation and risk reduction for disasters. Section 4 lays out Palau’s priorities for mitigating and minimizing GHG emissions. Section 5 prioritizes cross-sector institutional actions necessary to achieve the three objectives. Section 6 includes an indicative financing budget for implementing the first 5-year Action Plan. Because climate change and disasters touch every sector and every part of society, there are cross-cutting impacts and responses for all three objectives. Rather than repeat interventions that are applicable to multiple objectives, this Policy streamlines actions by placing them in the objective where they will have the most impact.

Each section lays out anticipated changes, such as expected changes to climate or probable risks from disasters, and then describes the foundation of existing initiatives on which this Policy is built. It lays out a strategic goal for achieving each objectives, and then summarizes priority interventions. A 5-year Costed Action Plan (**Annex 1**) describes the actions necessary to achieve the objectives in detail. The Action Plans are designed to be evaluated and updated in rolling 5-year increments (and are equivalent to regional Joint National Action Plans for Climate Change and Disaster Risk Management (JNAP).

## Guiding Principles

This Palau Climate Change Policy:

- Establishes a “No Regrets” approach to national development priorities. “No Regrets” is defined as an approach that achieves benefits under all possible future climate change and disaster scenarios, including both low emission and high emission (e.g. low impact and high impact) cases and worst case disaster scenarios;
- Subscribes to the IPCC definition of climate change, which refers to any change in climate over time, whether due to natural variability or as a result of human activity;
- Clarifies and links the roles, powers, duties, functions, and responsibilities of stakeholders within national and state governments, the private sector, civil society, communities, and Traditional Leadership;
- Guides national budgeting and fiscal year spending, informs sector (including private stakeholder) spending priorities, and facilitates domestic and international fundraising.





## Policy Development Process

The process to develop this Policy built on existing initiatives through a participatory, sector-based consultation effort. A multi-stakeholder Ad Hoc Climate Change Committee, with 10 sector working groups (in Agriculture and Fisheries, Health, Finance/Commerce/Economic Development, Biodiversity/Conservation/Natural Resources, Critical Infrastructure, Utilities, Society and Culture; Good Governance, Education, and Tourism), developed this Policy with input from communities, civil society, and teams of national experts. Over 150 individuals were involved in broad consultations to gather information and guide priorities. Standard planning tools included facilitator-led National workshops, sector-based focus groups, and 20 key informant interviews. Risk and capacity assessments followed accepted methods. Costs in the Action Plan were formed from expert opinions within sectors and then aligned and streamlined across sectors. In addition to assessments from earlier initiatives, this Policy incorporates the most recent peer reviewed scientific evidence and projections available. A list of documents used to develop this Policy is included in Annex 2. Additional technical and financial assistance was provided by the Secretariat of the Pacific Community, USAID, GIZ, FCG ANZDEC, and local consultants. Annex 3 includes more information on the process used to develop this Policy.



Top: Light through the water © Ethan Daniels/Shutterstock. Bottom, left to right: Partners in Palau observe and adapt to climate change in Palau. Far left photo © PCC. Right three photos © Carol Emaurois/PICRC.



# Introduction | Evidence and Impacts



## Evidence of Global Climate Change

The Intergovernmental Panel on Climate Change (IPCC), the world's leading international scientific body for the assessment of climate change, operates under the auspices of the United Nations (UN). It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. Membership in the IPCC is open to all UN Member Countries, and Palau was a member of the IPCC along with 21 other South-West Pacific nations. **Annex 4** includes more information on the mechanisms and causes of climate change.

In a 2014 Fifth Assessment Report, the IPCC reported that:

- Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history;
- Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850;
- Warming of the climate system due to human-induced greenhouse gases is unequivocal.

## Global Impacts from Climate Change

- Changes in climate have impacted natural and human systems on all continents and oceans.
- Oceanic uptake of carbon dioxide has resulted in acidification of the ocean;
- Melting of ice sheets, snow, and glaciers, reduced snow cover, and changing precipitation are altering hydrological systems, affecting water quantity and quality;
- Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions;
- Climate change has negatively impacted crop yields and marine organisms;
- There has been increased frequency and variability in extreme weather and climate events
- An increase in extreme high sea levels has been observed.
- Climate change will amplify existing risks and create new risks for natural and human systems.



## Impacts in Palau from Climate Change

As an island nation, Palau is vulnerable to the impacts of climate change, principally from sea level rise and the increase in extreme weather events. Palau is vulnerable to both human-induced and natural disasters, which may be exacerbated by climate change. Many of these impacts have already been felt in Palau and will continue to affect all sectors and geographic areas. So far, annual and seasonal maximum temperatures have increased since 1953 at a rate of 0.11°C (0.2°F), per decade, sea level has risen by about 0.35 inches per year since 1993, faster than the global average, and levels of ocean acidification have been rising since the 18<sup>th</sup> century. 2014 analysis by the Australian Bureau of Meteorology and the Commonwealth Scientific and Industrial Research Organization projects future impacts under the low emissions scenario to include:

Direct Impacts to Natural Systems (relative to 1995; most projections are medium to very high confidence)

- Sea-level rise of 3.0 to 6.3 inches by 2030 and 11.2 to 25 inches by 2090
- Increased frequency and severity of extreme weather events (particularly rain events), with increasing numbers of extreme rainfall days and rainfall intensity
- Changes in seasonal and annual rainfall, with projected increases in rainfall during the wet season
- Temperature regime changes, with projected increases in mean air temperatures of 0.5°C (0.9°F) to 1.0°C (1.8°F) by 2030 and an increase in the frequency of very hot days
- Increasing ocean acidification
- Decline in frequency of droughts and decline in typhoons (noting only medium to low confidence in these two specific projections)

Indirect/Exacerbated Impacts to Natural Systems

- Increased inundation, storm surges, erosion, and other coastal hazards
- Changes to quantity, quality, and variability in seasonal and annual flows of surface and underground water
- Increased coral bleaching events and increased coral mortality
- Declining fisheries and other marine resources
- Reduced functionality of ecosystems, particularly mangroves as coastal defences and nurseries
- Overall loss of marine and terrestrial biodiversity and productivity
- Increasing population, diversity, and range of invasive species

Indirect/Exacerbated Impacts to Economic Systems

- Negative impacts to the economy in the order of 4 to 20% of Gross Domestic Product (GDP), at between US\$9.88 to \$49.4 million/year
- Adverse effects to subsistence and commercial agriculture and fisheries
- Direct and indirect declines in income from tourism
- Economic losses in households and other sectors, particularly from extreme weather

Indirect/Exacerbated Impacts to Health Systems

- Reduced food security due to extreme weather events and changes in seasonal weather patterns;
- Human stress and mortality from extreme weather events
- Increases in the incidences and range of water-borne and vector-borne diseases



Examples of impacts in Palau. Top to Bottom: Salt water intrusion into a taro patch, Sea level rise, and destruction and damage after a Typhoon. All © Carol Emaurois/PICRC.

# Adaptation | Risks and Existing Activities

## Risks to Sectors from Direct Impacts of Climate Change

Ten sectors identified by the Ad Hoc Climate Change Committee identified priority risks from impacts from climate change. Priority risks were defined based on probability, frequency, and severity of impacts (social, environmental, economic) associated with climate change and disaster events, based on accepted methods used in the Caribbean and elsewhere. Assessments also evaluated capacity constraints and identified technically viable risk management options that constitute the basis for the Action Plan in this Policy. **Table 1** lists the top three priority risks for assessed sectors.

**Table 1. Priority Risks by Sector and Impact. Numbers indicate priority of risk.**

Sector	Priority Risks	Direct Impact				
		Sea level rise	Extreme weather events	Rainfall regime change	Temperature regime change	Ocean acidification
Agriculture and Fisheries	1. Salt water intrusion/ inundation (particularly taro patches)	X	X			
	2. Changes in fish movement and spawning seasons, negative impacts on marine species, & disruption to the food chain				X	
	3. Erosion/ sedimentation and changes in water quality impacting agricultural and marine resources and food security		X	X		
Health	1. Disruption of food supply/production systems, with increases in poor nutrition and non-communicable diseases (NCDs)	X		X		
	2. Damage or destruction of infrastructure (water, sewage, power, health etc.), disruption in community health services	X	X			
	3. Increases in water-borne and vector-borne diseases		X			
Biodiversity Conservation & Natural Resources	1. Decreased resilience of marine resources and coral reef systems					X
	2. Destruction and transformation of forest ecosystems		X		X	
	3. Coral bleaching and loss of vulnerable marine species and habitats				X	
Society & Culture	1. Negative impacts on traditional and subsistence food production		X			
	2. Disruption of social units (families, clans, communities, cheldebechel, etc.)		X			
	3. Changes in social behaviour and migration		X			
Tourism	1. Reduced food supply for visitors				X	
	2. Negative impacts on Palau's brand/image and tourism arrivals		X		X	
	3. Disruption to power and water supply and other essential services		X			
Critical Infrastructure	1. Damage or destruction to coastal infrastructure	X				
	2. Higher costs for development and maintenance of public infrastructure		X			
	3. Overloading and increased pressure on emergency response systems and damage to emergency response facilities		X			
Utilities	1. Damage to utilities leading to disruption of services		X			
	2. Damage to solid waste management systems with increased pollution and associated health impacts		X			
	3. Decrease in quantity and quality of water provided by utilities		X			
Finance, Commerce, & Economic Development	1. Damage and destruction to infrastructure, public facilities, and private and commercial facilities	X				
	2. Increased costs for prevention, clean-up, reconstruction, recovery, and operation of essential services during disasters		X			
	3. Increased costs of clean-up, loss of fishing income, and loss of tourism sector income		X			
Education	1. Damage or closing of schools and relocation of students		X			
	2. Increased costs of education		X			
	3. Science information used in curriculum is outdated	X		X	X	X



## Existing adaptation activities

Even without a formal Climate Change Policy, Palau and its development partners have undertaken a number of initiatives to address risks from and adapt to the expected impacts of climate change. Because climate change has such wide-reaching impacts, many of these existing activities also address the risks from unexpected disasters, and are not exclusive to adaptation. Similarly, many of the existing activities undertaken to address disasters also contribute to climate change adaptation. These activities include completed and ongoing projects.

### Planning

- Development of Community Local Early Action Plans (LEAP)
- Water security planning within watershed Conservation Action Plans
- Development of Sustainable Land Management (SLM) policies to build ecosystem resilience

### Research

- Vulnerability assessments in Koror, Kayangel, Ngaraard, Ngardmau, and Melekeok States
- Testing of salt tolerant varieties of taro and other crops

### Education and Capacity Building

- Community programs to teach children local practices and knowledge to sustain local resources
- Capacity building and increased training to fill skills gaps in the green sector
- Improved national capacity for coordination of climate change financing with donors

### Field Interventions

- Integrated, partner and community development and promotion of home gardens, local food production, income opportunities, and clean energy projects
- Demonstration projects in agriculture and aquaculture to increase local food production
- Improved access to health care, healthy productive ecosystems, employment, and clean water
- Disaster Risk Management measures as part of the recovery from Super Typhoon Bopha and Haiyan

After assessing impacts and risks from climate change and identifying existing efforts to adapt, the Working Groups of the Ad Hoc Climate Change Committee identified and prioritized gaps to develop strategic priorities.



An adaptation project in Palau: Construction of a dike system in a taro patch to reduce the impacts of sea level rise, coastal erosion, flooding, and salt water intrusion © PCC.

# Adaptation | Strategic Priorities

## Overview

The Palau Climate Change Policy takes a “no regrets” and precautionary approach to prioritisation of interventions, meaning that the interventions will be beneficial across sectors in all anticipated scenarios of climate change – whether low likelihood or worst case scenarios. Focus is on addressing near term, rather than longer-term environmental, social, and economic climate change impacts due to the five year time frame envisioned for the policy and action plan implementation, as well as the review against indicators in 4 years.

## Strategic Priorities

To achieve the strategic goal of climate resilience, priorities include identifying and protecting existing healthy and functioning natural and human systems, assessing and understanding vulnerabilities across sectors and geographic areas, and strengthening and improving the state of natural and human systems, including through initial planning steps. **Table 2** defines high-level government visions, objectives, and priority initiatives to proactively adapt to climate change and increase resilience. These high level directives form the basis of the first 5-year Action Plan (**Annex 1**), with associated targets for protection, knowledge, and improvements.

**Table 2. High-level government visions, objectives, and priority initiatives for adaptation.**

Sector and Relevant Action Plan Section	Vision	Objective	Palau Government's Priority Interventions
Agriculture and Fisheries (Annex 1, Section A)	A resilient, sustainable and food secured Palau	By 2020, the Palau agriculture and fisheries enabling framework is established to sustainably manage and support local food production and consumption	<ol style="list-style-type: none"> <li>1. Implement the National Policy, Institutional Framework and Strategy for Resilient Agriculture &amp; Aquaculture to improve farm production</li> <li>2. Build resilience to temperature change and ocean acidification in marine ecosystems/fisheries by protecting and improving coral sites</li> <li>3. Stabilize soils by amongst other measures, re-vegetation, and paving of roads in the Ngerikiil Watershed and other priority locations</li> </ol>
Health (Annex 1, Section B)	Healthy people in resilient communities	By 2020, the enabling framework is established to increase community resilience through improved access to health services	<ol style="list-style-type: none"> <li>1. Strengthen the capacity and resilience of existing health infrastructure</li> <li>2. Strengthen resilience within vulnerable communities including persons with disabilities</li> <li>3. Improve health services communication systems and preventative health services to build resilience to water-borne and vector-borne diseases</li> </ol>
Biodiversity Conservation and Natural Resources (Annex 1, Section C)	The people of Palau are resilient to climate change/ disasters and continue to protect and benefit (equitably) from our diverse natural & cultural heritage	By 2020, the enabling framework is established to build ecosystem resilience and sustainably manage carbon sinks using holistic and synergistic management approaches	<ol style="list-style-type: none"> <li>1. Undertake research on the carbon sink ability of and resilience of marine and terrestrial ecosystems to climate change and disasters</li> <li>2. Improve management frameworks to strengthen the resilience of marine and terrestrial ecosystems and sustainably manage carbon sinks</li> <li>3. Improve invasive species management, including through biosafety and biosecurity legislation.</li> </ol>
Society & Culture (Annex 1, Section D)	To conserve and protect the island nation and its communities from climate change and disaster impacts	By 2020, community resilience is strengthened through the establishment of sound institutional arrangements that are based on dynamic traditional systems, improved capacity building, a robust labor force, and effective emergency preparedness	<ol style="list-style-type: none"> <li>1. Establish a relocation/displacement or emergency support program for vulnerable members of society</li> <li>2. Establish multi-purpose emergency shelters in strategic locations for vulnerable members of society (including disabled)</li> <li>3. Develop and implement appropriate measures to support traditional leaders and vulnerable members of society in times of emergency</li> <li>4. Develop immigration/labor policies to, amongst other matters, better manage migrant workers and local laborers in times of emergency.</li> </ol>

## ADAPTATION STRATEGIC GOAL

**By 2020, the enabling framework is established to build climate resilience within ecosystems and society at the national, sector, and community levels, and within the private sector and civil society.**

**Table 2. (continued)**

Sector and Relevant Action Plan Section	Vision	Objective	Palau Government's Priority Interventions
Tourism (Annex I, Section E)	A sustainable, culturally-sensitive, and adaptive tourism sector that promotes a safe, environmentally-conscious, economically viable and pristine Palau	By 2020, establish the enabling framework to build climate change/ disaster resilience in the tourism industry while reducing the carbon footprint from tourism operations	<ol style="list-style-type: none"> <li>1. Mainstream climate change and disaster risk management in a National Sustainable Tourism Policy</li> <li>2. Undertake risk assessments and energy audits on tourism facilities and operations and develop climate/disaster risk management plans and energy conservation/efficiency plans</li> <li>3. Financially support transforming existing tourism facilities/operations to become climate/disaster resilient and energy efficient</li> <li>4. Establish a program to diversify tourism products</li> </ol>
Critical Infrastructure (Annex I, Section F)	Resilient infrastructure that fosters preparedness and adaptive capacity to address the impacts of climate change in Palau	By 2020, enabling framework established to strengthen resilience of critical infrastructure while reducing the carbon footprint from infrastructure	<ol style="list-style-type: none"> <li>1. Integrate climate change and disaster risk management into National and State Integrated Land Use and Marine Spatial Plans in accordance with SLM principles</li> <li>2. Undertake site-specific risks assessments and develop risk management plans for vulnerable infrastructure (private, commercial, and government, particularly for ports and docks)</li> <li>3. Develop, adopt and implement a climate/disaster resilient energy efficient building code</li> <li>4. Strengthen emergency response systems (capacity, equipment, financial resources, institutional structure)</li> </ol>
Utilities (Annex I, Section G)	A green and sustainable utility sector that provides reliable and affordable high-quality services that are resilient to climate change and disasters and that safeguard the environment	By 2020, establish the enabling framework to build resilience to climate change and disasters within Palau's utilities while reducing the carbon footprint from utilities	<ol style="list-style-type: none"> <li>1. Undertake site-specific risks assessments and develop risk management plans for utility facilities, services, and infrastructure</li> <li>2. Undertake energy audits for all utility facilities, services, and infrastructure</li> <li>3. Develop/expand carbon reduction programs for utilities</li> <li>4. Assess the viability of introducing waste-to-energy technologies and waste reduction/recycling measures</li> <li>5. Undertake a comprehensive water resource inventory and develop an integrated water resource management plan</li> </ol>
Finance, Commerce, & Economic Development (Annex I, Section H)	To have a responsible, dynamic, transparent, sustainable, and profitable climate/ disaster resilient low carbon economy	By 2020, the enabling framework is established to support the transition to a climate and disaster resilient low carbon economy	<ol style="list-style-type: none"> <li>1. Establish a National Disaster Recovery Fund and Insurance Program</li> <li>2. Strengthen the legislative and enforcement framework to address risks from climate change and disasters</li> </ol>
Education (Annex I, Section I)	Future Palauan generations will be proactive, knowledgeable, and accountable and will use traditional and new adaptation and mitigation tools to promote positive behavior change	By 2020, Palau's educational system will include coordinated climate change and disaster risk information in its school curriculum and offer educational outreach to the broader community	<ol style="list-style-type: none"> <li>1. Integrate climate change and disaster management into education policies and action plans</li> <li>2. Revise the current school curriculum to incorporate climate change and disaster management, develop teacher training modules, source instructional materials, and revise assessments</li> <li>3. Prioritize scholarship and education opportunities in climate change/ disaster management</li> <li>4. Implement professional training in climate/disaster related studies including through a Teachers Conference on climate change and disasters</li> <li>5. Improve access to information on climate change and disasters</li> </ol>



# Disaster Risk Management

## | Risks and Existing Activities



### Disaster Risks

The Palau National Disaster Risk Management Framework 2010 (NDRMF) highlights that Palau is vulnerable to a number of human-induced and natural disasters. Over the past forty years, Palau has experienced disasters such as typhoons, droughts, and the collapse of the Koror-Babeldaob Bridge. While disasters in Palau have been mostly “natural” events, human-induced or technological disasters are expected to increase in the future and may be exacerbated by climate change, if national development is not regulated or managed in a sustainable manner. **Table 3** lists natural and human-induced disasters. They have been rated in terms of their risk potential as high, medium or low.

**Table 3. Natural and human-induced disasters and their level of risk.**

Natural Disasters	Level of Risk
Storm Surge	High
Drought	High
Typhoon	High
Sea level rise (sea water intrusion, saline soil, coastal inundation, and erosion)	High
Tsunami	Low
Earthquake	Low
Landslides	Low

Human-induced and Other Disasters	Level of Risk
Oil Spill	High
Water contamination including sewerage	High
Solid Waste Disposal	High
Wildlife Behavior (affecting aircraft movement)	High
Increased sedimentation of watershed / coastal waters	High
Fire (industrial areas)	High
Emerging / infectious disease	High
Fire (residential)	Medium
Invasive Species	Medium
Hazardous substances spill	Medium
Terrorism	Low
Airport / Port incidents	Low
Civil uprising	Low
Political instability	Low



Trash on shore after a storm  
© Ethan Daniels/Shutterstock.

## Existing Activities to Manage Disaster Risks

Among other disaster-related documents, Palau developed the NDRMF, which was mandated by Executive Order No.287, which outlines priorities and processes for managing disasters and disaster risk. Existing actions to manage disaster risks include:

### Infrastructure

- Establishment of the National Emergency Management Office (NEMO) as the central coordinating agency for Disaster Management
- Maintenance by NEMO of resources and systems to monitor, evaluate, warn, and cope with the effects of a disaster
- Construction of a NEMO Emergency Operation Centre with Communication Room, Training Room/Briefing Room, Resting Area, and office spaces for the personnel
- Palau National Weather Office weather tracking systems which are linked to international weather tracking systems
- Emergency communication, early warning, and alerting systems through multiple media
- Tools and technologies in place such as Geographical Information Systems (GIS), satellite imagery, computer modelling software, and long-term climate predictions
- Identification of evacuation shelters in each community
- Improved solid waste management and recycling

### Education and Capacity Building

- Delivery of training programs through national, regional, or international training providers
- Formal and informal disaster risk management education and awareness programs offered by the National Weather Office and Palau Red Cross Society, among others
- Promotion of the 3Rs (reduce, reuse, and recycle)

### Planning and Evaluation

- Development of response plans by all government departments, private sectors, and media organisations to coordinate national disaster management
- Evaluation and reporting by NEMO on levels of disaster preparedness within departments, sectors, agencies, and communities
- Disaster risk assessment processes within agencies tasked with permitting development and major capital investments
- Development of a NDRMF and a Recovery Plan for Super Typhoon Bopha and Haiyan
- Participation in the Pacific Island Emergency Management Alliance and activities and capacity building to improve interoperability and cohesiveness between key response agencies

After assessing impacts and risks from climate change and identifying existing efforts to adapt, the Working Groups of the Ad Hoc Climate Change Committee identified and prioritized gaps to develop strategic priorities.

# Disaster Risk Management

## | Strategic Priorities

### Overview

This Policy reiterates and supports the strategic priorities in the National Disaster Risk Management Framework 2010 (NDRMF). As with Palau's approach to adaptation, disaster risk management also takes a proactive "No Regrets" approach that achieves benefits under even the worst case disaster scenario.

### Strategic Priorities

To achieve the goal of safe, resilient, and disaster-prepared communities in Palau, overall priorities include preparing for disasters and reducing disaster risk. Directives in this Policy include implementing the NDRMF, with particular emphasis on strengthening of national disaster risk management structures and mechanisms, including budgetary allocation processes.

Objectives of this Policy reiterate and expand on those in the NDRMF:

- Strengthening mechanisms for control, coordination, decision-making, accountability, and organizational arrangements for disaster management and disaster risk reduction
- Implementing organizational arrangements to maximize available resources
- Promoting integrated planning and collaboration for disaster management and Disaster Risk Reduction (DRR) across sectors

Priority interventions to meet these objectives are outlined in **Table 4**.

### DISASTER RISK MANAGEMENT STRATEGIC GOAL

**By 2020, the  
enabling  
framework is  
established  
to build safe,  
resilient, and  
disaster-  
prepared  
communities in  
Palau.**



A resort in Palau © Blue Orange Studio/Shutterstock



**Table 4. High level government visions and priority interventions for disaster risk management.**

Overall priority	Vision	Palau Government's Priority Interventions
Disaster Preparedness (Annex I, Section J)	Vulnerable communities have the knowledge and understanding of the hazards and risks to which they may be exposed to, in order to take appropriate actions to save lives and protect properties and the environment	<p>Incorporate internationally adopted response systems into the National Disaster Risk Management Framework and review national and state emergency preparedness and response arrangements to strengthen the interoperability of emergency response agencies</p> <p>Train national and state personnel in disaster response, relief, recovery and reconstruction</p> <p>Implement annual education, awareness programs and simulation exercises</p> <p>Upgrade existing shelters to use renewable energy where technically feasible and encourage construction of new ones away from hazardous locations</p> <p>Increase the disaster contingency fund allocation</p> <p>Increase the capacity of NEMO to undertake its functions and responsibilities</p>
Disaster Risk Reduction (Annex I, Section K)	<p>DRR programs are fully integrated at the national, state, and community levels and address priority hazards, community development, and disaster coping mechanisms, and that include relevant traditional knowledge and practices</p> <p>Processes in place confirm that DRR is carefully considered in national development projects or sectoral plans before making decisions on budget or resource allocation</p>	<p>Assess climate change and disaster vulnerability/risk at multiple levels</p> <p>Develop risk reduction and emergency evacuation plans for sectors and sites</p> <p>Develop, implement, and build capacity in resilient building codes</p> <p>Integrate risk into the community planning and development processes</p> <p>Promote disaster risk insurance program and micro-insurance programs</p> <p>Develop climate change and disaster loss database, with identification of site- and sector-specific vulnerabilities</p> <p>Retrofit existing buildings and structures to climate change and disaster resistant standards, including analyzing the national and state waste disposal systems for risks and improvements</p> <p>Integrate climate change and disaster risk reduction into school curricula</p> <p>Led by the Bureau of Budget &amp; Planning (BoBP) under the Ministry of Finance:</p> <ol style="list-style-type: none"> <li>1. Develop DRR standards and criteria specific to each sector's development</li> <li>2. Develop DRR mainstreaming policies in planning and budgetary decision making processes</li> <li>3. Improve mainstreaming of DRR in all phases of development planning and budgeting</li> <li>4. Develop and promote legislation to facilitate the incorporation and enforcement of risk assessments in development planning, decision-making, implementation, and management, including as part of the environmental impact assessment and permitting process</li> </ol>



Evidence of coastal erosion and sea level rise on a beach in Palau © Carol Emaurois/PICRC.

# Mitigation and Low Emission Development | Background

## Causes of Climate Change

Earth's atmosphere is composed of a "transparent blanket" of gasses, primarily nitrogen, oxygen, and argon, with trace amounts of carbon dioxide and water vapor. These gasses reflect, absorb, and re-radiate energy. The sun is the source of all of earth's energy. The sun's energy enters earth as light, which is absorbed and then released as heat. Gasses in the atmosphere act as a "natural" greenhouse, trapping just enough heat to make life as we know it possible on Earth. More information on the mechanisms of climate change are in **Annex 4**.

Since the start of the Industrial Revolution in about 1750, human activities have changed the composition of the atmosphere. In particular, burning of carbon-based fossil fuels such as coal, gasoline, diesel, and oil, which produce carbon dioxide gas as a byproduct, has increased the concentration of greenhouse gases (GHGs). Additionally, burning of forests (which store carbon) has contributed to increases in GHGs. As a result, the rate of heat-loss from the Earth has slowed, creating a warming effect.

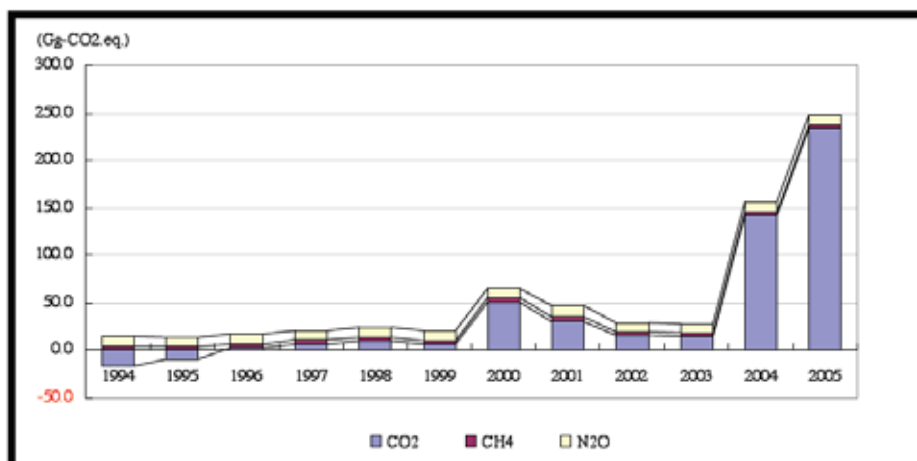
Increasing levels of carbon dioxide and other greenhouse gases result in global warming, which affects key elements of the climate. Both winds and rainfall are directly influenced by temperature, and thus the increasing greenhouse effect is expected to change many of the basic weather patterns that make up our climate, including wind and rainfall patterns and the incidence and intensity of extreme weather events. Global warming has significant consequences for the oceans, as more than 85 per cent of the additional heat in the atmosphere is absorbed by the oceans.

## Contribution by Palau to Global Greenhouse Gas Emissions

Greenhouse gas emissions in 2010 from Palau were on the order of 216 kilo tonnes (**Figure 1**; according to World Bank estimates), which is miniscule compared to the global total emission of 33,376,327 kilo tonnes. However, at 10.569 tons per person per year, on a per capita basis Palau is one of the highest emitters, ranking higher than China (6.195 tonnes per person) and ten times more than the Federated States of Micronesia (0.991 tons per person per year). Emissions from the energy sector represent the majority of emissions in Palau for all years

measured, ranging from between 84% to 96% of total emissions. Palau's energy economy relies almost completely on fossil fuels and consists of an annual supply of approximately 14.5 million gallons of diesel fuel, and 15.8 million gallons of gasoline. Almost all of Palau's diesel consumption is for power generation, with the rest being used for transport. Most of the diesel consumed for transport is used by fishing vessels and state-owned ferries, with little used for road transport.

**Figure 1. Palau's Emission Trends by Gas**



Source: Palau Second National Communication to the UNFCCC (OERC, 2013)



## Existing activities to manage causes of climate change

In 2010, Palau endorsed the National Energy Policy (NEP) along with an Energy Sector Strategic Action Plan to implement the NEP. The NEP called for improved institutional arrangements, increased energy efficiency, and the promotion of renewable energy. The NEP set national targets to reduce energy consumption by 30% by 2020 and to produce a minimum of 20% of electrical energy from renewable sources by 2020.

Activities in Palau to manage climate change have fallen into two categories: 1) reducing fossil-fuel based energy consumption and emission of GHGs, and 2) management of carbon sinks. Carbon sinks include terrestrial resources such as forests and marine resources such as coral reefs, which remove carbon from the atmosphere and convert it to biomass. Protecting forests from fires is one way Palau conserves its global carbon sinks. Methods to mitigate, manage, or reduce GHGs include:

### Alternative Energy Production

- Approximately 2.2% of Palauan energy use comes from local renewable energy sources. Palau has high solar energy potential. Solar water heating is used on many houses and tourist facilities. Large solar energy systems have produced as much as 11.6% of peak demand. Users who connect their systems to the grid may receive credits for excess energy produced.
- Palau's Bureau of Agriculture has experimented with a biogas pilot project for small pig farms
- Testing of renewable energy projects for infrastructure.
- Wind monitoring stations have been established at three locations in Babeldaob. Other entities have found a notable potential for wind energy.

### Energy Efficiency and Energy Conservation

- A shift to propane gas for cooking is reducing GHG emissions in the residential sector
- Conversion from two-stroke marine engines to more efficient engines is ongoing
- Utility-based programs to minimize waste and encourage energy conservation
- Subsidized funding for Compact Fluorescent Light bulbs for households
- Provision of low interest loans for energy efficient homes and industries
- Provision of loan subsidies for energy efficient retrofitting of residential and commercial buildings

### Planning and Research

- Development of an Energy Conservation Strategy
- Funding is in place for Technical studies to examine potential renewable energy resources.



View from a canoe © Androver/Shutterstock

# Mitigation and Low Emission Development | Strategic Priorities

## MITIGATION AND LOW EMISSION DEVELOPMENT STRATEGIC GOAL

**By 2020,  
Palau has  
established  
the enabling  
framework to  
sustainably  
manage  
carbon sinks  
(terrestrial and  
marine) and  
reduce national  
greenhouse  
gas emissions  
by at least 20%  
from 2005  
levels.**

### Overview

This section of this Policy focuses on the mitigation of causes of global climate change by reducing Palau's GHG emissions, achieved through a mixture of energy efficiency, low emission development, and management of carbon sinks. Priority risks and interventions for carbon sinks have been captured in Section 2 on Climate Change Adaptation, as Palau's primary carbon sinks are coral reefs, marine resources, and forests. Thus this part of the Policy focuses on the energy sector, primarily energy efficiency. Low emissions development – whether energy efficient or not – is a growth area within Palau. Many low emissions efforts have commenced, but are not advanced enough to be the focus of priority interventions beyond renewable energy.

This Policy reiterates and supports the priorities in the National Energy Policy 2010, which states the Government's strategies for the planning and management of the nation's energy sector to 2020. The National Energy Policy 2010 set national targets of a 20% contribution of renewable energy to the electrical energy mix by 2020 and a 30% reduction in energy consumption.

Palau will use this Policy to inform its pre-2020 Nationally Appropriate Mitigation Actions (NAMAs) and its post-2020 Intended National Determined Contributions (INDCs) under the UNFCCC. Other options and new technologies for low emission development may be considered during reviews of this Policy if environmentally sound and locally appropriate and may contribute to Low-Emission Development Strategies and Plans (LEDs), which will again form the basis of Palau's NAMAs and INDCs.

### Strategic Priorities

To achieve the goals of sustainably managing carbon sinks and reducing GHG emissions by at least 20%, overall priorities include improving institutional arrangements for energy sector management, promoting and/or mandating energy efficiency and energy conservation, expanding renewable energy production and use, and diversification and improving security of the existing electricity supply. Existing priorities for adaptation and disaster risk management will enable sustainable management of carbon sinks. **Table 5** outlines priority interventions to achieving these goals.

Improving institutional arrangements includes development and enforcement of an Energy Act outlined in the National Energy Policy 2010, with associated Energy Administration and a National Energy Committee (NEC). Achieving a 30% reduction in primary energy consumption by 2020 is feasible. This Policy recognizes that improving the efficiency of energy use will reduce energy consumption more than any other action and prioritizes actions that support adoption of high efficiency appliances and vehicles, energy efficient building standards, efficient modes of transport (including public), and smart planning. Government is also committed to energy efficient purchasing and construction.



Achieving a target of 20% renewable energy sourcing will require expansion into other forms of renewable energy such as wind, waste (landfill gas), hydropower, and/or marine energy (wave energy and currents). This Policy recognizes the role that development partners play in closing the gap between supply costs for renewable energy and conventional energy. Additional priorities include comprehensive assessments and analysis of options (including financing), data collection, and improved capacity, and development of renewable energy equipment standards. Renewable energy technologies shall be integrated in all outer island energy development by 2020.

To increase the security of Palau's electricity supply, the Palau Public Utilities Corporation (PPUC) will be allowed to recover all cost associated with the supply of electricity and encouraged to decentralize. Diversification includes both encouraging private sector participation in electricity supply, increasing renewable energy sources (including financing), increasing the number of products and services offered by PPUC.



Lush forest © PCS

**Table 5. High-level government objectives and priorities for Mitigation and Low Emission Development.**

Overall Priority	Objective	Palau Government's Priority Interventions
Improved institutional arrangements for energy sector management (Annex I, Section L)	An Energy Administration with the authority and support required for effective and transparent implementation of the National Energy Policy and the related Strategic Action Plan	Once the Energy Act is enacted 1. Establish and operationalize institutional structures to administer the new legislation. 2. Establish information and data systems for improved management of the energy sector.
Energy Efficiency and Energy Conservation (Annex I, Section M)	A 30% reduction in energy consumption by 2020, recognizing that improving the efficiency of energy use has greater short term impact on reducing fossil fuel consumption of fossil energy than any other action; with taxes and policies revised to encourage the import and sale of: appliances, vehicles, and boats having the highest energy efficiency; and with development of energy efficiency standards for new buildings and renovations including homes, businesses, and government premises.	1. <b>Energy Efficient Utilities</b> - Complete energy efficient utility upgrades in Koror and improve water and sewage infrastructure on Babeldaob and outlying states. Continue conversion of street lights to LED. 2. <b>Energy efficient houses</b> - Investigate funding support to expand the National Development Bank of Palau's energy efficiency program for new home construction and retrofitting of existing homes. 3. <b>Energy efficient transport</b> - Finalise and launch the "Complete Streets Policy" to improve traffic flows, reduce congestion, and support alternative transport. Procure and operate fuel efficient vehicles. 4. <b>Low carbon vehicles</b> - Investigate viable options and for the use of biofuels, including options for converting existing fleet of government vehicles. 5. <b>Energy efficient vehicles/equipment</b> - Develop and enact legislation to introduce economic instruments that encourage the import and sale of energy efficient appliances and vehicles and develop and implement national efficiency standards for electrical appliances and labelling based on existing international standards. 6. <b>Energy Efficient Building Code</b> - Develop and implement an energy efficient building code, upgrade government buildings to comply with the new code, and develop and launch education programs on energy efficiency and energy conservations in schools and colleges.
Renewable Energy (Annex I, Section N)	20% contribution of renewable energy to the energy mix by 2020, eventual long-term substitution of all fossil fuels with renewable energy, and minimizing Palau's carbon footprint, recognizing that renewable energies have the potential to reduce dependency on imported fuels and reduce the country's vulnerability towards price shocks	1. Determine technically and economically viable renewable technology energy options and develop a renewable energy strategy 2. Develop legislation to establish a feed-in tariff, establish renewable energy standards and operating procedures, establish connectivity or storage requirements to ensure grid stability, licensing, concessions on importation of technology, power purchase agreements, and to promote and license independent power producers (IPPs) 3. Establish a revolving fund to support IPPs and mobilize concessionary loans to support the financing of 5.6 Mw in renewable energy
Electric Power (Annex I, Section O)	A secure and diverse electricity supply	1. Determine technically and economically viable waste-to-energy and other options for Palau, and define enabling environment to promote private sector investment in such technologies 2. Identify and evaluate options to address loss in electrical power transmission and distribution, illegal connections, and overall grid loss/efficiency.

# Institutional Mechanisms for Effective Policy Implementation

## | Background and Strategic Priorities

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### Overview

To achieve the three goals of increased adaptation and resilience, improve disaster management, and mitigation of global climate change through low carbon emission development, this Policy prioritizes dedicated resources (human, technical, and financial) for climate change within a supportive legal and institutional enabling framework, with a centralized Climate Change Office. Priority interventions related to overall institutional management of this Policy are in **Table 6**.

### Existing Governance

There is no central focal point for climate change within the Palau government. The Office of Environmental Response and Coordination (OERC) within the Office of the President has the role of coordination within the Environment Sector and houses a National Climate Change Coordinator position. The Palau Grants Office is the National Focal Point for both the Adaptation Fund and the Green Climate Fund under the UNFCCC. The Vice President's Office houses NEMO. NEMO is also the Secretariat for the National Emergency Committee. The Ad Hoc Climate Change Committee will continue to serve as the National Climate Change Committee.

### Gaps in Good Governance (Government- to Sector-level)

Engagement by communities in building climate change resilience has been limited by competing interests, minimal capacity and understanding, and confusion arising from ad hoc government and partner projects on climate change that have not been aligned or coordinated. The absence of a central focal point for climate change and disaster risk programming has resulted in a limited ability to keep key stakeholders engaged over a sustained period of time, while the absence of core budget support from government for climate change programming has resulted in understaffed institutions with inadequate resourcing (human, technical, and financial) to effectively manage pressing climate change and disaster risk management priorities. Capacity assessments determined that within sectors:

- There is some understanding on vulnerabilities to risks from climate change or disasters
- There is limited understanding of mechanisms/strategies to manage risks
- There is limited information on energy efficient or renewable energy technologies
- There is limited understanding of how to transition to energy efficient or renewable energy operations
- Mainstreaming of climate change and disaster risk management into sector planning, development, and operations has been limited
- There are limited institutions and tools at sector and site specific levels to manage risks
- There are limited resources (human, technical, financial) and social capital available

## VISION

**Palau's enabling framework for good governance (effective, transparent, accountable, responsive, well-coordinated) is established to build resilience to climate change and disasters and manage the transformation to a low carbon economy utilising traditional and elected governance systems.**

**Table 6. High-level priorities for good governance and institutional management of this Policy.**

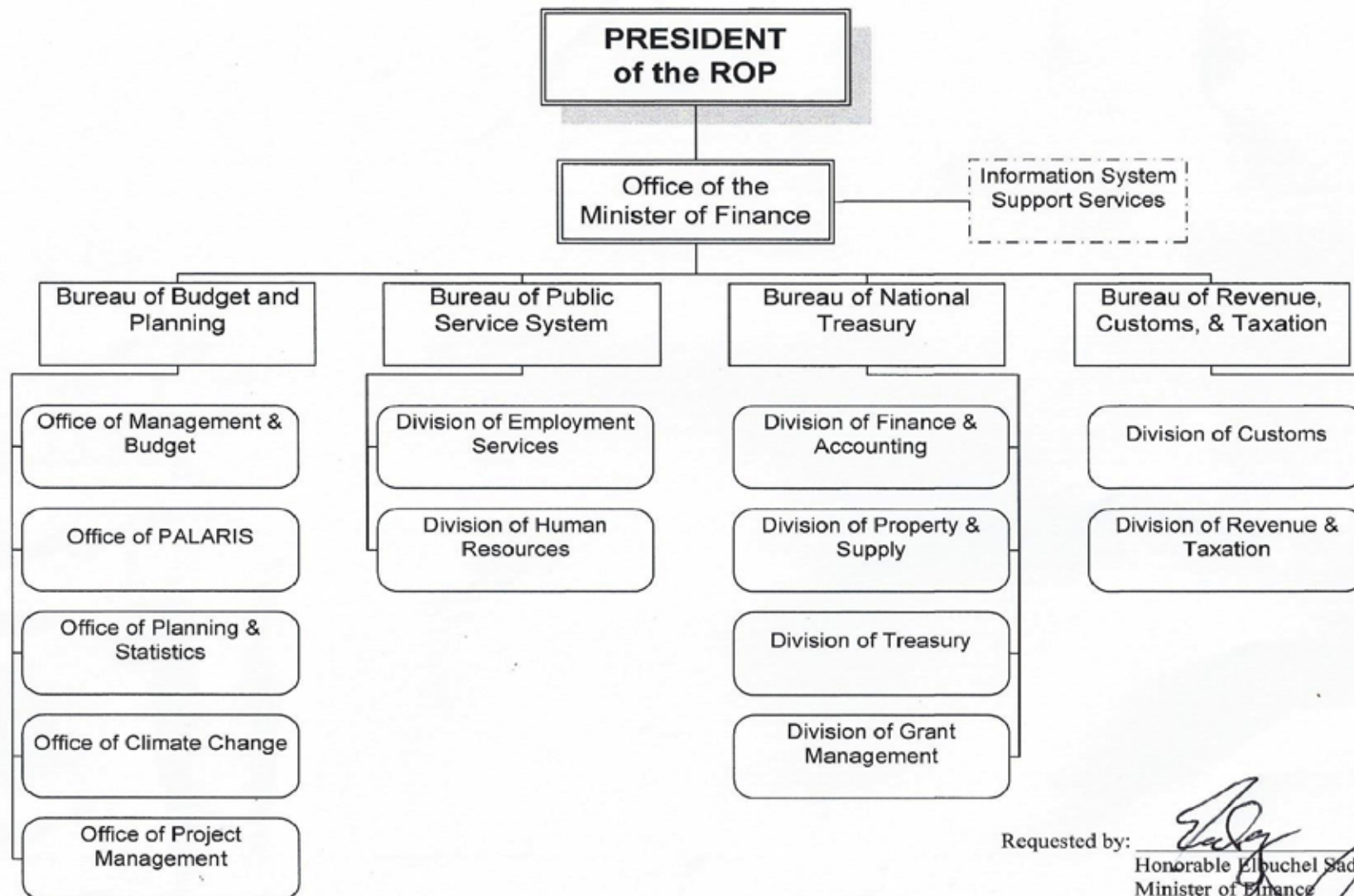
Overall Priority	Palau Government's Priority Interventions
Necessary institutional framework	<ol style="list-style-type: none"> <li>1. Adopt Policy and new organizational chart (Figure 2)</li> <li>2. Keep this Policy under regular review</li> <li>3. Mobilise resources (human, technical, financial) required to implement the Action Plan</li> </ol>
Centralized Climate Change Office	<ol style="list-style-type: none"> <li>1. Provide supportive Government budget allocations</li> <li>2. Provide the legal mandate and resources required to facilitate active engagement and participation by government agencies, civil society, communities, Traditional Leaders and the private sector</li> </ol>
Effective Climate Change Office (Annex I, Section P)	<ol style="list-style-type: none"> <li>1. Serve as focal point for all climate change programs in Palau</li> <li>2. Establish procedures and processes to mainstream climate change and DRR into environmental impact assessments (EIA), and sector and state planning and budget processes</li> <li>3. Assist government agencies with integrating climate change and disasters into their policies/programs and annual work plans</li> <li>4. Assist State Governments, private sector, and civil society in identifying risks from climate change/ disasters and activities to transform to a low carbon economy</li> <li>5. Establish databases and baseline information to monitor and report on effectiveness of the implementation of this Policy and ensure accessibility by the public at large to climate change information and data;</li> <li>6. Improve reporting to the UNFCCC, ISDR Sendai Framework for Disaster Risk Reduction, and other international conventions and regional strategies to which Palau is a party;</li> <li>7. Strengthen its institutional capacity so that it can qualify and register as a National Implementing Entity (NIE) under the Adaptation Fund and Green Climate Fund;</li> <li>8. Prepare proposals for submission to the Green Climate Fund and other development partners to implement the 5-year Action Plan.</li> </ol>

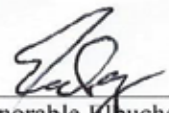




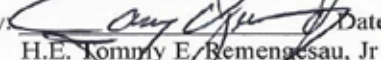
Figure 2. Institutional Framework for Effective Policy Implementation (Organizational Chart).

## MINISTRY OF FINANCE Organizational Chart



Requested by:   
Honorable Elouchel Sadang  
Minister of Finance

Date: 4/24/15

Approved by:   
H.E. Tommy E. Remengesau, Jr.  
President, Republic of Palau

Date: 4/24/15



## Monitoring and Evaluation

This Policy shall be reviewed annually by the Climate Change Office and an associated National Climate Change Committee against the Measurable Indicators in the Action Plan. Within 4 years of the adoption of this Policy, the National Climate Change Committee in collaboration with the Climate Change Office shall initiate a broad-based evaluation to determine the effectiveness of this Policy and implementation of the associated Action Plan and to develop the next 5-year Action Plan. Evaluation shall also consider the incorporation of social and gender safeguards as this Policy and its interventions are implemented. This Policy encourages exploration of a National Planning and Accountability Office to monitor, at a high level, the adherence of sectors to the “No Regrets” approach to ensure that interventions will be beneficial under all future scenarios.

# Financing Needs for Policy Implementation

**Table 7. Costs for implementing priority interventions (first 5 years).**

Policy Objective	Cost (US\$)
<b>Climate Change Adaptation</b>	
Agriculture and Fisheries	15,000,000
Health	6,300,000
Biodiversity Conservation & Natural Resources	13,700,000
Society and Culture	87,000,000
Tourism	118,000,000
Critical Infrastructure	36,500,000
Utilities	29,500,000
Finance, Commerce, & Economic Development	11,750,000
Education	4,150,000
Good Governance	9,700,000
<b>Adaptation Measures Total</b>	<b>331,600,000</b>
<b>Disaster Risk Management</b>	
Disaster Preparedness	11,500,000
Disaster Risk Reduction/Management	26,050,000
<b>Disaster Risk Management Measures Total</b>	<b>37,550,000</b>
<b>Mitigation and Low Emissions Development</b>	
Improved institutional arrangements for energy sector management	800,000
Energy efficiency and energy conservation measures	79,650,000
Renewable energy measures	25,850,000
Improvements in supply of electrical power	500,000
<b>Mitigation and Low Emission Development Measures Total</b>	<b>106,800,000</b>
<b>Total</b>	<b>475,950,000</b>

The cost to implement the priority interventions during the first 5-year Action Plan (**Annex 1**) is on the scale of US\$476 million dollars. This includes both government and sector costs. Costs were developed within sectors using expert judgement from professionals within each sector. The costs were then aligned and streamlined across the sectors to provide an overall assessment of financing needs. Costs are indicative of the scale of financing needed, and would require further elaboration within sectors before budgets are fully committed.

The Government of Palau will explore options for innovative and coordinated financing to implement this Policy, from varied sources such as multilateral and bilateral donors and regional and national funding mechanisms and using tools such as the Pacific Climate Change Finance Assessment Framework. The Government of Palau has strengthened its budgetary systems and is seeking accreditation as a National Executing Entity to both the Adaptation Fund and the Green Climate Fund. Sector agencies will need to undertake detailed climate change and disaster risk planning and budgeting. Innovative financing approaches and operations will be explored, including options such as microfinance, levies, subsidies, soft loans, emergency funds, sovereign insurance, contingent credit, catastrophe bonds, and intergovernmental risk pooling.





**“For it is only by taking control of our territory and our sovereignty that we can ensure that generations more of Palauans can preserve their heritage and enjoy the natural bounty provided to us.”**

**PALAU PRESIDENT  
TOMMY E. REMENGESAU JR.  
UNITED NATIONS, 2014**

By establishing this Policy Palau is taking necessary steps to make its own National plans a reality and meet its obligations under the UNFCCC and other regional and international agreements.

More importantly, though, by following the priorities in this Policy, Palau’s government and sector leaders will contribute to a global effort to minimize the impacts of climate change, and will build a more resilient and prepared nation that can thrive even in a changing world.

**“Palau is an inspiring example of a small island nation courageously addressing the global challenges of climate change and biodiversity loss through a blue-green economy transition...  
“We should look upon small island nations like Palau as microcosms of our larger society, and not stand back and leave them to grapple with threats - such as climate change.”**

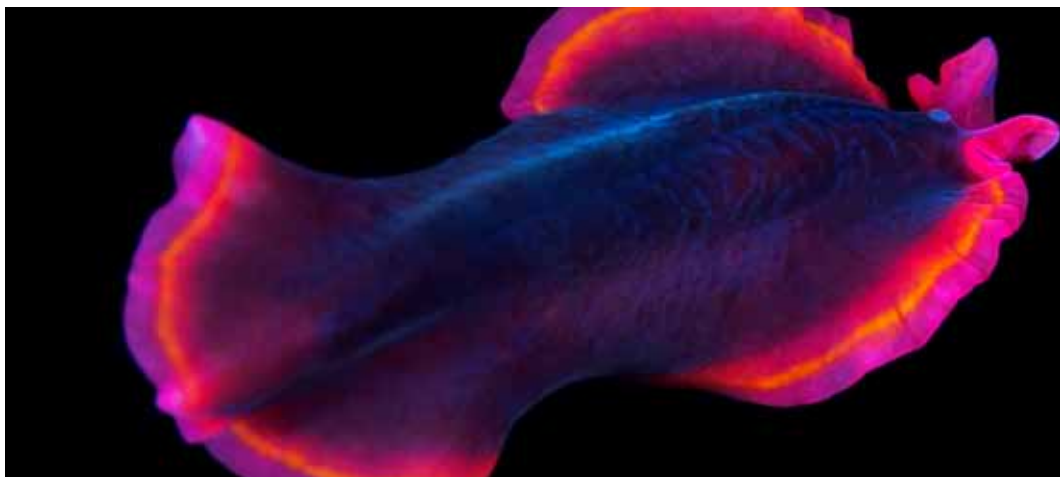
**UN UNDER-SECRETARY-  
GENERAL AND  
UNEP EXECUTIVE DIRECTOR  
ACHIM STEINER, 2014**



# Annexes

## Acronyms

ACCC	Adapting to Climate Change in the Caribbean
ADB	Asian Development Bank
AG	Attorney General
AIPVAA	An Integrative Planning and Vulnerability Assessment Approach
BCI	Bureau of Curriculum and Instruction
BEEA	Belau Educators and Employers Alliance
BFSCA	Belau Family School Community Association
BLS	Bureau of Lands and Survey
BMR	Bureau of Marine Resources
BMZ	German Federal Ministry for Economic Cooperation and Development
BOA	Bureau of Agriculture
BPW	Bureau of Public Works
BTA	Belau Tourism Association
CC	Climate Change
CCCPIR	Coping with Climate Change in the Pacific Island Region
CIP	Capital Improvement Program
CO <sub>2</sub>	Carbon Dioxide
CROP	Council of Regional Organisations in the Pacific
CRRF	Coral Reef Research Foundation
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECO	Energy Conservation Officer
EQPB	Environmental Quality Protection Board
ESSAP	Energy Sector Strategic Action Plan
FSM	Federated States of Micronesia
GCCA	Global Climate Change Alliance
GIS	Geographical Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IPCC	Inter-Governmental Panel on Climate Change
IPP	Independent power producer
IWRM	Integrated Water Resources Management
JICA	Japan International Cooperation Agency
KSPLA	Koror State Public Lands Authority
kW	Kilowatt
LED	Light-emitting diode
MCCA	Ministry of Community and Cultural Affairs
MNRET	Ministry of Natural Resources, Environment, and Tourism
MOE	Ministry of Education
MOF	Ministry of Finance
MOH	Ministry of Health
MOJ	Ministry of Justice
MOS	Ministry of State
MPA	Marine Protected Area
MPIIC	Ministry of Public Infrastructure, Industries, and Commerce
MSC	
Mw	Megawatt
NAP	National Adaptation Plan
NCD	Non-communicable disease



Nudibranch © J'nel/Shutterstock

NDBP	National Development Bank of Palau
NDRMF	National Disaster Risk Management Framework
NEC	National Energy Committee (in Mitigation and Low Emission Development)
NEMO	National Emergency Management Office
NEP	National Energy Policy
NEPC	National Environmental Protection Council
NGO	Nongovernmental Organization
NIE	National Implementing Entity
NISS	National Invasive Species Strategy
OEK	Olbiil Era Kelulau (Palau National Congress)
OERC	Office of Environmental Response and Coordination
OP	Office of the President
OPS	Office of Planning and Statistics
OTGF	
PALARIS	Palau Automated Land and Resource Information System
PAN	Protected Areas Network
PCAA	Palau Community Action Agency
PCC	Palau Community College
PCC-CRE	Palau Community College Cooperative Research Extension
PCS	Palau Conservation Society
PEO	Palau Energy Office
PHA	Palau Housing Authority
PICRC	Palau International Coral Reef Center
PNCC	Palau National Communications Corporation
PPA	Pacific Power Association
PPLA	Palau Public Lands Authority
PPP	Public Private Partnership
PPUC	Palau Public Utilities Corporation
PSIS	Pacific Small Islands States
PVA	Palau Visitor's Authority
PW	
RMI	Republic of the Marshall Islands
ROP	Republic of Palau
SAP	Strategic Action Plan
SBDC	Small Business Development Center
SGP	Small Grants Program
SLM	Sustainable Land Management
SOPAC	Pacific Islands Applied GeoScience Commission
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
TNC	The Nature Conservancy
UAK	Ulkerreuil A Klengar
UN	United Nations
UNDP	United Nations Development Programme
US DoE	United States Department of Education
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WEF	World Economic Forum
WMO	World Meteorological Organization
WSC	Water Science Center



## Annex 1 – 5-Year Costed Action Plan, SECTION A through P.\*

\*Costs indicative of scale of financing necessary. Costs derived through expert judgement and aligned across sectors.

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
<b>CLIMATE CHANGE ADAPTATION</b>					
<b>SECTION A: Agriculture and Fisheries Sector</b>			<b>OBJECTIVE: By 2020, the Palau agriculture and fisheries enabling framework is established to sustainably manage and support local food production and consumption</b>		
Intervention A.1	Implement the <i>National Policy, Institutional Framework and Strategy for Resilient Agriculture &amp; Aquaculture</i> to improve farm production	Year 1 – Year 5	PCC-CRE BOA	\$10,000,000	<ul style="list-style-type: none"> <li>Total area of land used for taro production increased by 50%.</li> <li>Farm production improved.</li> </ul>
Intervention A.2	Build resilience to temperature change and ocean acidification in marine ecosystems/fisheries by protecting coral sites	Year 1 – Year 3	MNRET BMR, PAN, PICRC, CRRF, PCS, TNC, State Government	\$2,000,000	<ul style="list-style-type: none"> <li>Increased number of resilient coral sites protected.</li> <li>Total area of coral increased</li> </ul>
Action A.2.1	Undertake detailed site-specific studies on the impacts of temperature change and ocean acidification on marine ecosystems/fisheries	Year 1 – Year 3	PICRC		<ul style="list-style-type: none"> <li>Study started and completed</li> </ul>
Action A.2.2	Based on the results of such research, launch coral replanting in viable coastal areas that have been affected by bleaching	Year 1 – Year 3	MNRET State Governments		<ul style="list-style-type: none"> <li>Number / Area of coral planted</li> </ul>
Intervention A.3	Stabilize soils by amongst other measures, re-vegetation, and paving of roads in the Ngerikiil Watershed and other priority locations.	Year 1 – Year 4	State Government BOA, CIP	\$3,000,000 (Grants/Stimulus)	<ul style="list-style-type: none"> <li>Water quality improvements indicate reduction in sedimentation and erosion</li> </ul>
Action A.3.1	Revegetate Ngerikiil Watershed and other priority watersheds	Year 1 – Year 4	State Government		<ul style="list-style-type: none"> <li>Total area of revegetated land increases</li> </ul>
Action A.3.2	Pave roads in Ngerikiil and other priority watersheds	Year 3 – Year 4	CIP, State Government		<ul style="list-style-type: none"> <li>Total length of paved road increases</li> </ul>
<b>SECTION B: Health</b>			<b>OBJECTIVE: By 2020, the enabling framework is established to increase community resilience through improved access to health services</b>		
Intervention B.1	Strengthen the capacity and resilience of existing health infrastructure	Year 2	MOH		
Activity B.1.1	Babeldaob & outlying states - Equip health centers in Babeldaob and Youldaob for emergency services. (2 centers in Babeldaob and 1 center in Youldaob)	Year 2	MOH NEMO	\$1,200,000 ((X-ray, Medical supplies Comm. Equip, Water supply, Alt. Energy -Generator, solar panel)	<ul style="list-style-type: none"> <li>3 Centers have been equipped with proper health equipment &amp; -health providers (#) and -are included as part of NEMO</li> <li>-are included as part of mock emergency training</li> </ul>
Activity B.1.2	Identify & train community members to provide basic emergency health services and communicate with MOH Emergency Services	Year 2	MOH NEMO		<ul style="list-style-type: none"> <li>Number of community members trained</li> </ul>
Activity B.1.3	Equip health centers with proper medical equipment & communication system	Year 2	MOH NEMO		<ul style="list-style-type: none"> <li>Number and type of health centers with improved equipment</li> </ul>
Activity B.1.4	Equip w/ Alternative Energy	Year 2	MOH NEMO		<ul style="list-style-type: none"> <li>Number of centers with self-sustaining alternative energy</li> </ul>
Activity B.1.5	Vulnerable, disabled - Coordinate a process to identify all disabled in Babeldaob & outlying areas	Year 2	Omekesang MCCA, MOH	\$50,000	<ul style="list-style-type: none"> <li>All disabled have contacts and addresses are identified</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Activity B.1.6	Communities in high risk areas, Malakal & barracks – Assess risk and develop risk management plan	Year 2	KSPLA MPIIC, NEMO, PALARIS	\$50,000	<ul style="list-style-type: none"> <li>Number of residents and businesses contacted and with addresses identified</li> </ul>
Intervention B.2	Strengthen resilience within vulnerable communities including persons with disabilities	Year 1 – Year 5	MOH		
Activity B.2.1	Improve access to innovative financing for relocation and/or climate proofing	Year 1 – Year	OEK NDBP, PHA	\$1,000,000	<ul style="list-style-type: none"> <li>Innovative financing mechanisms established</li> <li># of people in vulnerable areas relocated with help of innovative financing increases</li> </ul>
Activity B.2.2	Facilitate local food production within vulnerable segments of society (persons with disability, low income households, elderly, single mothers)	Year 1 – Year 5	BOA Civil Society Partnerships	\$750,000	<ul style="list-style-type: none"> <li># households with family gardens increases</li> </ul>
Activity B.2.3	Develop and facilitate the adoption of nutritional guidelines for daily food consumption amongst vulnerable segments of society.	Year 1 – Year 5	BOA and Civil Society Partnership (UAK, PCAA, Kotel A Deurreng, Red Cross, Churches, Community groups)		<ul style="list-style-type: none"> <li># families adopting nutrition guidelines for vegetable consumption increases</li> </ul>
Intervention B.3	Improve health services communication systems and preventative health services to build resilience to water-borne and vector-borne diseases	Year 1 – Year 5	Civil Society Partnership (UAK, PCAA, Kotel A Deurreng, Red Cross, Churches, Community groups)	\$450,000	<ul style="list-style-type: none"> <li>Number and type of health communications and preventative services offered increases</li> <li>Reduction in number of cases of water-borne and vector-borne diseases.</li> </ul>
<b>SECTION C: Biodiversity Conservation &amp; Natural Resources</b>			<b>OBJECTIVE: By 2020, the enabling framework is established to build ecosystem resilience and sustainably manage carbon sinks using holistic and synergistic management approaches</b>		
Intervention C.1	Undertake research on the carbon sink ability of and resilience of marine and terrestrial ecosystems to climate change and disasters	Year 1 – Year 2	MNRET		<ul style="list-style-type: none"> <li>Understanding of carbon sinks in Palau increased</li> </ul>
Action C.1.1	Undertake research focused on carbon sink ability and resilience	Year 1 – Year 2	MNRET PICRC		<ul style="list-style-type: none"> <li>Study completed</li> </ul>
Intervention C.2	Improve management frameworks to strengthen the resilience of marine and terrestrial ecosystems and sustainably manage carbon sinks	Year 1 – Year 3	MNRET BOA	\$5,700,000	<ul style="list-style-type: none"> <li>MPA established and/or meeting effectiveness criteria <ul style="list-style-type: none"> <li>-# of species conserved</li> <li>-#area of marine protected</li> <li>-# of sanctuaries</li> </ul> </li> <li>Reduced amount of sediment entering reefs</li> </ul>
Action C.2.1	Integrating SLM into PAN Management plans & State SLMs	Year 1 – Year 5	MNRET		<ul style="list-style-type: none"> <li>SLM activities integrated in PAN activities</li> </ul>
Action C.2.2	Ensure resilience of forest ecosystems by: <ul style="list-style-type: none"> <li>-Developing a forest management policy &amp; regulations</li> <li>-Identify key old growth areas for protection</li> <li>-Manage/control/prevent invasive species</li> <li>-Adopt &amp; implement new biosecurity legislation</li> <li>-Post typhoon damage assessments</li> </ul>	Year 1 – Year 5	MNRET		<ul style="list-style-type: none"> <li>Policy written and adopted</li> <li>Maps of: old growth, invasive species, wetlands</li> <li>Control initiated</li> </ul>
Action C.2.3	MPAs in Palau PAN are ecologically connected (baseline assessments, nationwide management frameworks)	Year 1 – Year 5	MNRET	\$1,000,000	<ul style="list-style-type: none"> <li>PAN design complete</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Action C.2.4	Eliminate overfishing especially in herbivorous fisheries (size limits/ quotas MPAs etc.) and complete ban [advocacy & data collection regulations]	Year 1 – Year 5	MNRET		<ul style="list-style-type: none"> <li>Increased density of herbivores</li> </ul>
Intervention C.3	Improve invasive species management, including through biosafety and biosecurity legislation.	Year 1 – Year 5	MNRET		<ul style="list-style-type: none"> <li>Threats from invasive species reduced or maintained</li> </ul>
Action C.3.1	Implement the National Invasive Species Strategy (NISS)	Year 1 – Year 5	MNRET	\$5,000,000	<ul style="list-style-type: none"> <li>Number of activities in the NISS increases</li> </ul>
<b>SECTION D: Society and Culture</b>			<b>OBJECTIVE: By 2020, community resilience is strengthened through the establishment of sound institutional arrangements that are based on dynamic traditional systems, improved capacity building, a robust labor force, and effective emergency preparedness</b>		
Intervention D.1	Establish a relocation/displacement or emergency support program for vulnerable members of society	Year 1 – Year 5	MCCA Rubekul Belau, Mechesil Belau, Governors Association, PPLA	\$5,000,000	<ul style="list-style-type: none"> <li>Emergency support system in place for vulnerable members of society</li> </ul>
Action D.1.1	Undertake a study on historical settlement sites to assess possible relocation sites	Year 1 – Year 5	MCCA		<ul style="list-style-type: none"> <li>Study completed</li> </ul>
Action D.1.2	Establish a relocation/ displacement program	Year 1 – Year 5	MCCA		<ul style="list-style-type: none"> <li>Land designated for displaced community members</li> <li>Regulations established</li> </ul>
Intervention D.2	Establish multi-purpose emergency shelters in strategic locations for vulnerable members of society (including disabled)	Year 1 – Year 5	State Governments	\$80,000,000	<ul style="list-style-type: none"> <li>Each state and Koror State hamlets will have a multi-purpose community center</li> </ul>
Action D.2.1	Establish cultural/community/multi-purpose centers in every state run by local communities (Eldebechel) that can serve as relocation/ displacement/ disaster shelters (and accommodate disabled)	Year 1 – Year 5	Eldebechel		<ul style="list-style-type: none"> <li>Number of centers able to serve as shelters</li> </ul>
Intervention D.3	Develop and implement appropriate measures to support traditional leaders and vulnerable members of society in times of emergency	Year 1 – Year 5	MCCA Governors Association, Rubekul Belau, Mechesil Belau, Eldebechel		<ul style="list-style-type: none"> <li>Traditional leaders and vulnerable members of society are better supported during times of emergency</li> </ul>
Action D.3.1	Support and revive Klobak and Eldebechel (traditional and non-traditional)	Year 1 – Year 5	MCCA	\$1,000,000	<ul style="list-style-type: none"> <li>Stronger, more self-sufficient Klobak and Eldebechel and well established</li> </ul>
Action D.3.2	Establish/support a Kinship Registry	Year 1 – Year 5	MCCA	\$500,000	<ul style="list-style-type: none"> <li>Registry of Palauan kinship</li> </ul>
Intervention D.4	Develop immigration/labor policies to, amongst other matters, better manage migrant workers and local laborers in times of emergency.	Year 1 – Year 5	MOJ MCCA, NGOs, OEK	\$500,000	<ul style="list-style-type: none"> <li>Strengthened immigration laws</li> <li>Strengthened labor laws</li> </ul>
Action D.4.1	Strengthen existing immigration and labor laws addressing migrant workers and local laborers	Year 1 – Year 5	MOJ		<ul style="list-style-type: none"> <li>Established Homeland Security guidelines</li> <li>-Stronger enforcement</li> <li>-Repatriation guidelines</li> </ul>
Action D.4.2	Establish Visa system	Year 1 – Year 5	MOJ		<ul style="list-style-type: none"> <li>Visa requirements established w/ fees (including international police clearance)</li> </ul>



Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
<b>SECTION E: Tourism</b>			<b>OBJECTIVE: By 2020, establish the enabling framework to build climate change/ disaster resilience in the tourism industry while reducing the carbon footprint from tourism operations</b>		
Intervention E.1	Mainstream climate change and disaster risk management in a National Sustainable Tourism Policy	Year 1 – Year 3	Bureau of Tourism PVA, BTA, Palau Chamber of Commerce, Palau Boaters Association	\$500,000	<ul style="list-style-type: none"> <li>National Sustainable Tourism Policy and Action Plan developed</li> <li>National budget allocated to of Tourism Policy and Action Plan.</li> </ul>
Intervention E.2	Undertake risk assessments and energy audits on tourism facilities and operations and develop climate/disaster risk management plans and energy conservation/efficiency plans	Year 1 – Year 4	Bureau of Tourism PVA, BTA, Palau Chamber of Commerce, Palau Boaters Association	\$3,000,000	<ul style="list-style-type: none"> <li>Management plans for every tourism facility and operator developed, including operator risk management plans</li> </ul>
Intervention E.3	Financially support transforming existing tourism facilities/ operations to become climate/disaster resilient and energy efficient	Year 1 – Year 5	Ministry of Finance Bureau of Tourism, PVA, BTA, Palau Chamber of Commerce, Palau Boaters Association	\$50,000,000 (loan on concessional terms)	<ul style="list-style-type: none"> <li>Financing mechanisms in place</li> <li>Climate/Disaster Resilience use in marketing materials</li> </ul>
Intervention E.4	Establish a program to diversify tourism products	Year 1 – Year 5	Ministry of Finance Cultural Affairs		<ul style="list-style-type: none"> <li>Number of tourists rise</li> <li>Number of tourists using alternative attractions rises</li> </ul>
Action E.4.1	Establish concessionary loan to assist the tourism industry in developing and establishing new and additional attractions	Year 1 – Year 5	Ministry of Finance Private sector (loans)	\$50,000,000 (loan on concessional terms)	<ul style="list-style-type: none"> <li>Number of tourism attractions increases</li> </ul>
Action E.4.2	Advertising (international and domestic) and improved information technology.	Year 1 – Year 5	PVA Office of the President	\$15,000,000	<ul style="list-style-type: none"> <li>Advertisements feature climate/disaster resilience and/or new attractions</li> </ul>
<b>SECTION F: Critical Infrastructure</b>			<b>OBJECTIVE: By 2020, enabling framework established to strengthen resilience of critical infrastructure while reducing the carbon footprint from infrastructure</b>		
Intervention F.1	Integrate climate change and disaster risk management into National and State Integrated Land Use and Marine Spatial Plans in accordance with SLM principles	Year 1 – Year 5	OERC		<ul style="list-style-type: none"> <li>Climate change and DRM better integrated into and marine use plans</li> </ul>
Action F.1.1	Develop and implement national zoning & planning policy linked to SLM	Year 1 – Year 2	MPIIC Palaris, BLS	\$2,000,000	<ul style="list-style-type: none"> <li>Development of policy</li> <li>State land use plans in place</li> </ul>
Action F.1.2	Integration of Climate Change & DRM into National and State Land Use Plans	Year 1 – Year 5	State Governments PPUC/WSC, PNCC	\$3,200,000	<ul style="list-style-type: none"> <li>Initial development of infrastructure consistent with strategies &amp; planning</li> </ul>
Intervention F.2	Undertake site-specific risks assessments and develop risk management plans for vulnerable infrastructure (private, commercial, and government, particularly for ports and docks)	Year 1 – Year 5	BPW		<ul style="list-style-type: none"> <li>Vulnerable infrastructure identified and vulnerabilities reduced</li> </ul>
Action F.2.1	Carry out risk assessments to identify vulnerable infrastructure and develop appropriate risk mgmt. plans	Year 1 – Year 2	BPW/PALARIS	\$300,000	<ul style="list-style-type: none"> <li>Data collected and entered</li> <li>Risk management plans developed</li> <li>Upgraded sewer layer</li> </ul>
Action F.2.2	Prioritize & identify cost for each infrastructure - via consultations w/ national, state & local communities	Year 3	OERC	\$50,000	<ul style="list-style-type: none"> <li>List of priority infrastructure improvements developed with costs</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Action F.2.3	Relocate National Hospital	Year 1 – Year 5	MOH	\$100,000,000	<ul style="list-style-type: none"> <li>Financing in place</li> <li>Hospital relocated</li> </ul>
Intervention F.3	Develop, adopt and implement a climate/disaster resilient energy efficient building code	Year 1 – Year 5	Public Works		<ul style="list-style-type: none"> <li>Buildings have improved energy efficiency</li> </ul>
Action F.3.1	Develop climate/disaster resilient energy efficient building code	Year 1 – Year 2	Public Works, Energy Office, NEMO, OERC, Chamber of Commerce	\$2,000,000	<ul style="list-style-type: none"> <li>Code developed and adopted</li> </ul>
Action F.3.2	Provide training on new climate/disaster resilient energy efficient building code	Year 3	Public Works, Energy Office, NEMO, OERC, Chamber of Commerce	\$500,000	<ul style="list-style-type: none"> <li>Number of individuals trained in new code</li> </ul>
Intervention F.4	Strengthen emergency response systems (capacity, equipment, financial resources, institutional structure)	Year 1 – Year 3	NEMO	\$25,000,000 (emergency fund)	<ul style="list-style-type: none"> <li>Emergency response systems in place and improved</li> </ul>
Action F.4.1	Strengthening emergency response systems and early warning systems, including Capacity, Equipment, Financial resources, and Structure (e.g. roles of ministries)	Year 1-3	NEMO MPIIC, MOJ, MOH, PPUC, PNCC, Traditional Leaders, State Governments	\$3,500,000	<ul style="list-style-type: none"> <li>Emergency Response System Committee established and empowered</li> <li>Recovery time improves</li> </ul>
<b>SECTION G: Utilities</b>			<b>OBJECTIVE: By 2020, establish the enabling framework to build resilience to climate change and disasters within Palau's utilities while reducing the carbon footprint from utilities</b>		
Intervention G.1	Undertake site-specific risks assessments and develop risk management plans for utility facilities, services, and infrastructure	Year 1 – Year 5	PPUC MPIIC/MOE, PNCC		<ul style="list-style-type: none"> <li>Improved infrastructure services</li> <li>Reduced outage and delay of services</li> </ul>
Action G.1.1	Undertake site-specific risks assessments and develop risk management plans	Year 1 – Year 2	PPUC MPIIC/MOE, PNCC	\$1,000,000	<ul style="list-style-type: none"> <li>Assessments and management plans completed</li> </ul>
Action G.1.2	Upgrade vulnerable utilities	Year 3 – Year 5	PPUC MPIIC/MOE, PNCC	\$5,000,000 (PPUC)	<ul style="list-style-type: none"> <li>Number of vulnerable utilities upgraded</li> </ul>
Intervention G.2	Undertake energy audits for all utility facilities, services, and infrastructure	Year 1 – Year 2	PPUC MPIIC/MOE, PNCC	\$500,000	<ul style="list-style-type: none"> <li>Reduction of GHG emissions</li> <li>Audits completed</li> </ul>
Intervention G.3	Develop/expand carbon reduction programs for utilities	Year 3 – Year 5	PPUC MPIIC/MOE, PNCC	\$5,000,000	<ul style="list-style-type: none"> <li>Waste reduction</li> <li>Guidelines for validation/verification</li> </ul>
Intervention G.4	Assess the viability of introducing waste-to-energy technologies and waste reduction/recycling measures	Year 1 – Year 2	PPUC MPIIC/MOE, PNCC	\$500,000	<ul style="list-style-type: none"> <li>Assessments completed</li> </ul>
Intervention G.5	Undertake a comprehensive water resource inventory and develop an integrated water resource management plan	Year 1 – Year 5	Public Works		<ul style="list-style-type: none"> <li>Improved water quality and quantity of potable water</li> </ul>
Action G.5.1	Water resource inventory	Year 1 – Year 3	Public Works EQPB	\$2,000,000	<ul style="list-style-type: none"> <li>Inventory completed and priority needs identified</li> </ul>
Action G.5.2	Develop integrated water resource management plan	Year 1 – Year 3	Public Works EQPB	\$500,000	<ul style="list-style-type: none"> <li>Management plan completed</li> </ul>
Action G.5.3	Upgrade water systems	Year 1 – Year 5	Public Works EQPB	\$5,000,000	<ul style="list-style-type: none"> <li>Number of water systems upgraded</li> <li>Number of people with improved water systems</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
<b>SECTION H: Finance, Commerce, &amp; Economic Development</b>			<b>OBJECTIVE: To have a responsible, dynamic, transparent, sustainable, and profitable climate/disaster resilient low carbon economy</b>		
Intervention H.1	Establish a National Disaster Recovery Fund and Insurance Program		MOF		<ul style="list-style-type: none"> <li>Financial resilience after disasters improved</li> </ul>
Action H.1.1	Establish Disaster Recovery Fund	Year 1 – Year 5	MOF, OEK, UN	\$10,000,000	<ul style="list-style-type: none"> <li>Account set and available for use</li> </ul>
Action H.1.2	Establish insurance program for Government infrastructure	Year 1 – Year 2	MOF, MPIIC, OEK	\$1,000,000	<ul style="list-style-type: none"> <li>Insurance plan established and in use</li> </ul>
Intervention H.2	Strengthen the legislative and enforcement framework to address risks from climate change and disasters	Year 1 – Year 5	EQPB MOH, PVA, AG's office, MPIIC, traditional institutions, state govts, NEMO		<ul style="list-style-type: none"> <li>Legislative Framework in place better prepares for and responds to disasters</li> </ul>
Action H.2.1	Develop, draft and enact legislation	Year 1		\$250,000	<ul style="list-style-type: none"> <li>EQPB Regulations in place</li> </ul>
Action H.2.2	Strengthen enforcement capacity	Year 1 – Year 5		\$500,000	<ul style="list-style-type: none"> <li>Number of reports, inventories, monitoring reports, fines</li> </ul>
<b>SECTION I: Education</b>			<b>OBJECTIVE: By 2020, Palau's educational system will include coordinated climate change and disaster risk information in its school curriculum and offer educational outreach to the broader community</b>		
Intervention I.1	Integrate climate change and disaster management into education policies and action plans	Year 1 – Year 2	MOE	\$250,000	<ul style="list-style-type: none"> <li>Have strategic plan for MOE completed and approved by 2017</li> </ul>
Intervention I.2	Revise the current school curriculum to incorporate climate change and disaster management, develop teachers training modules, source instructional materials, and revise assessments	Year 1 – Year 2 Year 4	MOE	\$1,600,000	<ul style="list-style-type: none"> <li>Curriculum that incorporates climate change and disaster management revised</li> <li>Teacher training modules for curriculum implementation develop</li> <li>Instructional materials for implementation of revised curriculum purchased</li> </ul>
Action I.2.1	Revise current school curriculum, pilot revised curriculum, and make final changes based on pilot	Year 1 – Year 3 Year 4	MOE		<ul style="list-style-type: none"> <li>Curriculum revised</li> <li>Piloting of revised curriculum completed</li> <li>Curriculum finalized based on pilot and adopted</li> </ul>
Action I.2.2	Develop training modules and train teacher to use revised curriculum	Year 2 – Year 4 Year 5	MOE		<ul style="list-style-type: none"> <li>Training modules completed</li> <li>Teachers trained to implement curriculum</li> <li>All teachers trained to implement new curriculum</li> </ul>
Action I.2.3	Source instructional materials: (books, apps, lab equipment, etc.)	Year 1 – Year 5	MOE-BCI (Bureau of Curriculum & Instruction)		<ul style="list-style-type: none"> <li>Inventory of materials completed</li> <li>Instructional materials made available for all students</li> </ul>
Action I.2.4	Assessment (PAT) -hire consultant to write assessment -pilot assessment -teacher training to use assessment	Year 1 – Year 2 Year 3	MOE		<ul style="list-style-type: none"> <li>Assessments completed</li> <li>Teacher training completed</li> <li>Assessments implemented</li> </ul>
Intervention I.3	Prioritize scholarship and education opportunities in climate change/disaster management	Year 1 – Year 5	Scholarship Office MOE, Congress	\$1,000,000	<ul style="list-style-type: none"> <li>Scholarship list climate related studies as a priority</li> <li>Number of scholarships offered and awarded for climate change and disaster management</li> </ul>



Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Intervention I.4	Implement professional training in climate/disaster related studies including through a Teachers Conference on climate change and disasters	Year 2 – Year 4	National Emergency Council		<ul style="list-style-type: none"> <li>Trainers guide pamphlet is produced and disseminated</li> <li>Trainers have been trained to go out to site-visits</li> <li>Professional training established &amp; implemented annually</li> </ul>
Action 1.4.1	Teachers Education Conference dedicated to climate change	Year 2	MOE	\$400,000	<ul style="list-style-type: none"> <li>Number of teachers participating in climate change conference</li> </ul>
Action 1.4.2	Establish office at MOE to help in coordination, implementation, monitoring, and evaluation of climate change and disaster management activities	Year 1	MOE	\$100,000	<ul style="list-style-type: none"> <li>Office established</li> <li>Staff hired</li> </ul>
Action 1.4.3	Conduct community outreach for adults and youth on climate change/disasters and their impacts on communities.	Year 2 – Year 3	MOE	\$300,000	<ul style="list-style-type: none"> <li>Number of communities reached</li> <li>Number of adults served</li> <li>Number of youth served</li> </ul>
Intervention I.5	Improve access to information on climate change and disasters	Year 2 – Year 3	MOE & MOS BFSCA, BEEA, Private Schools	\$2,000,000	<ul style="list-style-type: none"> <li>Repository of information established</li> <li>Resources identified and made available</li> </ul>

## DISASTER RISK MANAGEMENT

### SECTION J: Disaster Preparedness

**VISION: Vulnerable communities have the knowledge and understanding of the hazards and risks to which they may be exposed to, in order to take appropriate actions to save lives and protect properties and the environment**

Intervention J.1	Incorporate internationally adopted response systems into the National Disaster Risk Management Framework and review national and state emergency preparedness and response arrangements to strengthen the interoperability of emergency response agencies	Year 1 – Year 3	NEMO		<ul style="list-style-type: none"> <li>Response systems strengthened and using best practices</li> </ul>
Action J.1.1	Upgrade early warning systems and communication framework	Year 1	NEMO	\$400,000	<ul style="list-style-type: none"> <li>Early warning systems upgraded</li> </ul>
Action J.1.2	Provide technical assistance to support development of climate change and disaster risk assessments and preparedness plans for communities and across all sectors.	Year 1 – Year 3	NEMO OERC	\$500,000	<ul style="list-style-type: none"> <li>Number of risk assessments and preparedness plans increases</li> </ul>
Intervention J.2	Train national and state personnel in disaster response, relief, recovery and reconstruction	Year 1	NEMO		<ul style="list-style-type: none"> <li>Number of trained individuals increases</li> </ul>
Action J.2.1	Provide training on disaster preparedness at all levels of community	Year 1	NEMO	\$150,000	<ul style="list-style-type: none"> <li>Training module prepared and delivered</li> </ul>
Intervention J.3	Implement annual education, awareness programs and simulation exercises	Year 1	NEMO		<ul style="list-style-type: none"> <li>Number of educational activities and simulations increases</li> </ul>
Intervention J.4	Upgrade existing shelters to use renewable energy where technically feasible and encourage construction of new ones away from hazardous locations	Year 1 – Year 5	NEMO		<ul style="list-style-type: none"> <li>Shelters increasingly use renewable energy and are in safe locations</li> </ul>
Action J.4.1	Identify suitable multi-purpose emergency shelters. and ensure suitability for use by persons with disability	Year 1	NEMO	\$100,000	<ul style="list-style-type: none"> <li>Locations identified</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Action J.4.2	Equip shelters with rainwater tanks, backup generators, medical supplies and emergency food.	Year 1 – Year 5	NEMO	\$6,000,000	<ul style="list-style-type: none"> <li>Number of shelters with minimum equipment</li> </ul>
Action J.4.3	Provide training exercises on the use of such shelters.	Year 1 – Year 5	NEMO	\$100,000	<ul style="list-style-type: none"> <li>Number of individuals trained increases</li> </ul>
Action J.4.4	Construct new shelters or upgrade existing shelters which should be off-grid and use renewable energy where technically feasible	Year 2 – Year 5	NEMO	\$3,500,000 (7 shelters)	<ul style="list-style-type: none"> <li>Number of shelters built or upgraded</li> </ul>
Intervention J.5	Increase the disaster contingency fund allocation	Year 1	OEK		<ul style="list-style-type: none"> <li>Financial resilience increased due to access to fund</li> </ul>
Intervention J.6	Increase the capacity of NEMO to undertake its functions and responsibilities	Year 1	OEK		<ul style="list-style-type: none"> <li>NEMO better manages disasters and reduces risk</li> </ul>
Action J.6.1	Upgrade capacity of NEMO (DRR Officer, Response Officer, Education/Training Officer, Community Outreach Officer, Disaster Planning Officer and Information Technology Officer).	Year 1	NEMO	\$450,000	<ul style="list-style-type: none"> <li>Staffing at NEMO</li> </ul>
Action J.6.2	Professional training for NEMO staff	Year 1 – Year 5	NEMO	\$300,000	<ul style="list-style-type: none"> <li>Number of staff trained</li> </ul>
<b>SECTION K: Disaster Risk Reduction</b>			<b>VISION: DRR programs are fully integrated at the national, state, and community levels and address priority hazards, community development, and disaster coping mechanisms, and that include relevant traditional knowledge and practices</b>		
Intervention K.1	Assess climate change and disaster vulnerability/risk at multiple levels	Year 1	NEMO OERC	\$250,000	<ul style="list-style-type: none"> <li>Assessments identify risks and vulnerabilities</li> </ul>
Action K.1.1	Undertake community level climate change and disaster vulnerability and risk assessments	Year 1	NEMO		<ul style="list-style-type: none"> <li>Number of assessments completed</li> </ul>
Action K.1.2	Support the development of community-level risk management plans.	Year 1 – Year 5	NEMO		<ul style="list-style-type: none"> <li>Number of management plans completed</li> </ul>
Intervention K.2	Develop risk reduction and emergency evacuation plans for sectors and sites	Year 1	NEMO OERC	\$250,000	<ul style="list-style-type: none"> <li>Plans identify and communicate risk reduction and emergency evacuation procedures</li> </ul>
Action K.2.1	Undertake community level climate change and disaster vulnerability and risk assessments for vulnerable businesses, utilities and other essential services	Year 1	NEMO		<ul style="list-style-type: none"> <li>Number of assessments completed</li> </ul>
Action K.2.2	Support the development of site-specific risk management plans.	Year 1	NEMO		<ul style="list-style-type: none"> <li>Number of management plans completed</li> </ul>
Intervention K.3	Develop, implement, and build capacity in resilient building codes	Year 1 – Year 3	NEMO, OERC, PEO	\$1,000,000	<ul style="list-style-type: none"> <li>Code developed and implemented</li> </ul>
Action K.3.1	Provide training on new code	Year 3 – Year 5	NEMO	\$500,000	<ul style="list-style-type: none"> <li>Number of individuals trained</li> </ul>
Intervention K.4	Integrate risk into the community planning and development processes	Year 1	OERC		<ul style="list-style-type: none"> <li>Disaster risk is addressed in existing and new plans</li> </ul>
Action K.4.1	Include climate change and disaster risks as part of the EIA and permitting process.	Year 1	EQPB	\$75,000	<ul style="list-style-type: none"> <li>EIA and permitting process updated</li> </ul>
Action K.4.2	Undertake LIDAR surveys to identify and map vulnerable areas to guide development planning	Year 2	OERC	\$1,000,000	<ul style="list-style-type: none"> <li>LIDAR surveys completed</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Action K.4.3	Capacity building (including legislation) for physical planning and integration of vulnerability maps and energy efficient, climate and disaster resilient building code into physical planning process which is on GIS platform.	Year 4	OERC	\$1,250,000	<ul style="list-style-type: none"> <li>Number of individuals with built capacity</li> <li>Code included into planning process documents</li> </ul>
Action K.4.4	Review and update NDRMF 2010	Year 1	OERC	\$100,000	<ul style="list-style-type: none"> <li>NDRMF updated</li> </ul>
Action K.4.5	Continue training exercise including for developing and rolling out best practices to disaster response, and monitor efficiency.	Year 2	NEMO	\$250,000	<ul style="list-style-type: none"> <li>Number of training exercises</li> </ul>
Action K.4.6	Establish disaster contingency fund to respond in times of emergency (overlaps with F.4)	Year 2	OEK	\$25,000,000 (already included in F.4)	<ul style="list-style-type: none"> <li>Fund established and in place</li> </ul>
Intervention K.5	Promote disaster risk insurance program and micro-insurance programs	Year 3	MOF	\$50,000	<ul style="list-style-type: none"> <li>Number of individuals using insurance programs increases</li> </ul>
Intervention K.6	Develop climate change and disaster loss database, with identification of site- and sector-specific vulnerabilities	Year 1	NEMO	\$75,000	<ul style="list-style-type: none"> <li>Database identifies vulnerabilities</li> </ul>
Intervention K.7	Retrofit existing buildings and structures to climate change and disaster resistant standards, including analyzing the national and state waste disposal systems for risks and improvements	Year 1 – Year 5	CIP		<ul style="list-style-type: none"> <li>Number of buildings retrofitted</li> </ul>
Intervention K.8	Integrate climate change and disaster risk reduction into school curricula	Year 1 – Year 5	MOE		<ul style="list-style-type: none"> <li>Curricula updated</li> </ul>

## MITIGATION AND LOW EMISSION DEVELOPMENT

SECTION L: Improved Institutional Arrangements for Energy Sector Management			OBJECTIVE: An Energy Administration with the authority and support required for effective and transparent implementation of the National Energy Policy and the related Strategic Action Plan		
Intervention L.1	Establish and operationalize institutional structures to administer the new legislation and Energy Policy.	Year 1 – Year 5	NEC PEO, PPUC, PCC, MOS, MPIIC, PCAA, AGs Office		<ul style="list-style-type: none"> <li>Institutional structures support Energy Policy and legislation</li> </ul>
Action L.1.1	Design and implement a sector-wide capacity building program	Year 1 – Year 5	PEO NEC, OP, PPUC	\$200,000	<ul style="list-style-type: none"> <li>Number of individuals trained, certificates obtained</li> </ul>
Action L.1.2	Align energy policies with other resource policies and strategic plans and translate into performance-based budget	Year 1 – Year 5	PEO	\$150,000 (\$30,000 p.a.)	<ul style="list-style-type: none"> <li>Cross references in other policies MoUs and joint declarations</li> </ul>
Intervention L.2	Establish information and data systems for improved management of the energy sector.	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Information systems help improve energy sector management</li> </ul>
Action L.2.1	Develop, regularly update and manage national energy database to support effective analysis and project development	Year 1 – Year 5	PEO / PPUC Oil companies, Statistics office, PALARIS	\$ 100,000	<ul style="list-style-type: none"> <li>Information accessible on internet and in publications</li> </ul>
Action L.2.2	Constantly review energy supply, delivery, and distribution methods and make recommendations for efficient operation and reliability, addressing procurement regulations, economics, technological innovations, supplier relationships, reliability and any other factors directly related to optimizing energy sector investments	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Number of reviews</li> <li>Number and type of recommendations</li> </ul>



Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
<b>SECTION M: Energy Efficiency and Energy Conservation</b>			<b>OBJECTIVE: A 30% reduction in energy consumption by 2020, recognizing that improving the efficiency of energy use has greater short term impact on reducing fossil fuel consumption of fossil energy than any other action; with taxes and policies revised to encourage the import and sale of: appliances, vehicles, and boats having the highest energy efficiency; and with development of energy efficiency standards for new buildings and renovations including homes, businesses, and government premises</b>		
Action M.i	Continue Implementation of the Palau Energy Efficiency Action Plan and the Palau Energy Conservation Strategy	Year 1 – Year 5	PEO MNRET, PPUC, NGOs, MPIIC, PCAA, promotion by Executive Branch	\$500,000	<ul style="list-style-type: none"> <li>Energy savings against 2008 baseline</li> </ul>
Action M.ii	Design energy conservation curricula and training material for all educational institutions in Palau starting with primary school	Year 1 – Year 2	PEO NEC, MOE, PCC, Media, PCAA, Private Schools, NGOs	\$120,000	<ul style="list-style-type: none"> <li>Energy conservation has become a regular subject in Palau's educational system</li> </ul>
Action M.iii	Continue training of Government ECOs and expand training to include private sector and NGO representatives	Year 1 – Year 5	PEO PPUC, NGOs	\$250,000 (\$50,000 per year)	<ul style="list-style-type: none"> <li>Results of skill survey to be performed in 2012</li> </ul>
Action M.iv	Develop a comprehensive set of educational material related to energy conservation and energy efficiency in co-operation with regional and subregional partners	Year 1 – Year 5	PEO PEO, NGOs, MOE, NDBP, PPUC, CROP agencies, media	\$250,000 (\$50,000 per year)	<ul style="list-style-type: none"> <li>Materials developed and distributed</li> </ul>
Action M.v	Establish an energy conservation web site allowing the public to retrieve relevant data and information on energy efficient equipment, incentive programs (concessionary loans) and conservation tips	Year 1 – Year 5	PEO Energy offices Guam Saipan, CROP agencies, SPC, SOPAC, US DoE, Grants Office, SBDC, MoS	\$20,000	<ul style="list-style-type: none"> <li>Quality information and material accessible on internet</li> </ul>
Intervention M.1	<b>Energy Efficient Utilities</b> - Complete energy efficient utility upgrades in Koror and improve water and sewage infrastructure on Babeldaob and outlying states. Continue conversion of street lights to LED.	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Utilities have improved energy efficiency</li> </ul>
Intervention M.2	<b>Energy efficient houses</b> - Investigate funding support to expand the National Development Bank of Palau's energy efficiency program for new home construction and retrofitting of existing homes.	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Number of energy efficient homes increases</li> </ul>
Action M.2.1	Expand energy efficient housing (and home renewable energy) through concessionary finance for efficient building features and appliances	Year 1 – Year 5	PEO, NGOs, SGP, USDA, Palau Housing, OEK, Grant Office	\$5,000,000	<ul style="list-style-type: none"> <li>Number of loans</li> <li>Total loan portfolio (US\$)</li> </ul>
Intervention M.3	<b>Energy efficient transport</b> - Finalise and launch the "Complete Streets Policy" to improve traffic flows, reduce congestion, and support alternative transport. Procure and operate fuel efficient vehicles.	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>GHGs from transportation reduced</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Action M.3.1	Review current transport systems with respect to efficiency, reliability, and affordability	Year 1	PEO NEC, MPIIC, Customs, OPS, Division of Transportation, Bureau of Public Safety, Shipping Agents, MoF	\$50,000	<ul style="list-style-type: none"> <li>Study published, recommendations for policy and legislation regarding vehicle importation</li> </ul>
Action M.3.2	Implement the Complete Streets program	Year 1 – Year 5	PEO	\$950,000	<ul style="list-style-type: none"> <li>Complete Streets program completed</li> </ul>
Intervention M.4	<b>Low carbon vehicles</b> - Investigate viable options and for the use of biofuels, including options for converting existing fleet of government vehicles.	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Number of low carbon vehicles increases</li> </ul>
Intervention M.5	<b>Energy efficient vehicles/equipment</b> - Develop and enact legislation to introduce economic instruments that encourage the import and sale of energy efficient appliances and vehicles and develop and implement national efficiency standards for electrical appliances and labelling based on existing international standards.	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Sales of energy efficient vehicles, equipment, and appliances increases</li> </ul>
Action M.5.1	Design and implement and enforce a mandatory energy labelling program for major equipment and appliances (fridges, freezers, air conditioners, lights, washing machines, etc.)	Year 1 – Year 2	PEO NEC, Private, Customs, Tax, OEC, PPUC	\$250,000	<ul style="list-style-type: none"> <li>All energy equipment sold in Palau rated and labelled</li> </ul>
Intervention M.6	<b>Energy Efficient Building Code</b> - Develop and implement an energy efficient building code, upgrade government buildings to comply with the new code, and develop and launch education programs on energy efficiency and energy conservations in schools and colleges.	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Buildings increase energy efficiency</li> </ul>
Action M.6.1	Adopt an Energy Code for inclusion into National Building code	Year 1 – Year 3	PEO NDBP, PPUC, Private, SLM, MPIIC, OERC, OEC – CIP Committee	\$250,000	<ul style="list-style-type: none"> <li>Energy code incorporated into building code, licensed inspectors appointed</li> </ul>
Action M.6.2	Upgrade government buildings to comply with Code	Year 4 – Year 5	PEO	\$10,000,000	<ul style="list-style-type: none"> <li>Number of building upgrades</li> </ul>
<b>SECTION N: Renewable Energy</b>			<b>OBJECTIVE: 20% contribution of renewable energy to the energy mix by 2020, eventual long-term substitution of all fossil fuels with renewable energy, and minimizing Palau's carbon footprint, recognizing that renewable energies have the potential to reduce dependency on imported fuels and reduce the country's vulnerability towards price shocks</b>		
Intervention N.1	Determine technically and economically viable renewable technology energy options and develop a renewable energy strategy	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Renewable Energy Strategy guides implementation of renewable technologies</li> </ul>
Action N.1.1	Assess in detail the national potential of renewable energies (solar, wind, hydro, ocean, waste, biomass) and compile national resource database	Year 1 – Year 5	PEO NEC, PPUC, development partners, PALARIS	\$350,000	<ul style="list-style-type: none"> <li>Database developed and accessible for general public, data published</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Action N.1.2	Keep current on renewable energy technology development and update list of recommended technologies accordingly	Year 1 – Year 5	PEO PPUC, MPIIC, Private, NDBP, PCC	\$50,000	<ul style="list-style-type: none"> <li>New entries in list of recommended technologies, seminars and conferences attended</li> </ul>
Action N.1.3	Develop Renewable Energy Strategy	Year 1	PEO PPUC, NDBP, Palau Housing Authority	\$250,000	<ul style="list-style-type: none"> <li>Net metering bill signed into law (should not be detrimental to PPUCs economic viability and should maintain fair market prices for customers)</li> </ul>
Action N.1.4	Educate general public on renewable energy opportunities	Year 1 – Year 5	PEO CROP agencies, NGOs, NDBP	\$100,000	<ul style="list-style-type: none"> <li>Quality information and material accessible</li> </ul>
Action N.1.5	Convert outer island power supply systems to hybrid configuration and operate systems in efficient mode	Year 2	PPUC PEO, State Governments		<ul style="list-style-type: none"> <li>Fuel consumption reduced to 50% of 2009 baseline</li> </ul>
Action N.1.6	Promote solar hot water systems for all new high cost residential and commercial buildings	Year 1 – Year 5	NDBP Private sector, NDBP, Palau Housing Authority	Included in loan	<ul style="list-style-type: none"> <li>Number of solar water heaters installed</li> </ul>
Action N.1.7	Design and implement pilot projects for small and medium scale wind energy generation (2 - 100 kW) once study proves feasible for wind	Year 1 – Year 5	PEO NEC, PPUC, Palau Housing Authority	Included elsewhere	<ul style="list-style-type: none"> <li>kW of wind energy connected to the grid</li> </ul>
Action N.1.8	Develop and apply a standard scrutinizing procedure for all unsolicited renewable energy proposals offered to the government	Year 1 – Year 5	PEO & PPUC NEC, regional organizations, PPUC		<ul style="list-style-type: none"> <li>Study on carbon finance opportunities published</li> <li>Standard procedures published</li> </ul>
Action N.1.9	Engage with all development partners in order to promote priority projects of the SAP	Year 1 – Year 5	PPUC NEC, MoF, OP, MPIIC, MCCA		<ul style="list-style-type: none"> <li>Donors accept projects from pipeline</li> </ul>
Action N.1.10	Investigate and pursue sub-regional biofuel bulk procurement initiative between FSM, RMI & ROP	Year 1 – Year 5	MSC OTGF, PPUC, Petroleum Suppliers	\$100,000	<ul style="list-style-type: none"> <li>Regional procurement initiative established</li> </ul>
Intervention N.2	Develop legislation to establish a feed-in tariff, establish renewable energy standards and operating procedures, establish connectivity or storage requirements to ensure grid stability, licensing, concessions on importation of technology, power purchase agreements, and to promote and license independent power producers (IPPs)	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Legislation supports multiple elements of renewable energy</li> </ul>
Action N.2.1	Develop Feed In Tariff	Year 1 – Year 5	PPUC  PEO, MPIIC, private sector, PPUC, NDBP	\$250,000	<ul style="list-style-type: none"> <li>SPPA drafted and published</li> <li>Promotion campaign</li> <li>Signed agreement</li> <li>Private developers investing in IPP projects</li> </ul>
Intervention N.3	Establish a revolving fund to support IPPs and mobilize concessionary loans to support the financing of 5.6 Mw in renewable energy	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Financing for renewable energy increases</li> </ul>
Action N.3.1	Identify and develop medium scale projects conducive for IPP investment (hydro, wind) and tender projects competitively	Year 1 – Year 5	PPUC PEO, NGOs, PCC	\$50,000	<ul style="list-style-type: none"> <li>Approved</li> <li>Project identified and tendered</li> </ul>



Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
Action N.3.2	Mobilise concessionary loans to support financing of 5.6 Mw of Renewable Energy	Year 1 – Year 3	NDBP PEO, NEC	\$25,000,000	<ul style="list-style-type: none"> <li>Loan volume disbursed for renewable energy finance</li> <li>Number of loans</li> </ul>
Action N.3.3	Explore all carbon finance opportunities for renewable energies	Year 1 – Year 5	PEO, OP NDBP, MOF, MOS	\$100,000	<ul style="list-style-type: none"> <li>Study on carbon finance opportunities published</li> </ul>
<b>SECTION O: Electric Power</b>			<b>OBJECTIVE: A secure and diverse electrical power supply using technically and economically feasible methods while ensuring sustainability, quality and continuity of existing electrical generation, distribution, and transmission systems</b>		
Intervention O.1	Determine technically and economically viable waste-to-energy and other options for Palau, and define enabling environment to promote private sector investment in such technologies	Year 1 – Year 5	PEO		<ul style="list-style-type: none"> <li>Private sector investment in alternative technologies increases</li> <li>Alternative energy technologies increases</li> </ul>
Action O.1.1	Study opportunities and options for private sector participation and public private partnerships in electricity supply	Year 1 – Year 5	PEO NEC, OP, MoF, MoS	\$75,000	<ul style="list-style-type: none"> <li>Study on PPP options published and accepted by NEC and OEK.</li> </ul>
Action O.1.2	Explore opportunities for waste to energy project on Koror Babeldaob	Year 2 – Year 3	PEO PPUC, PW Koror State Govt.	Included elsewhere	<ul style="list-style-type: none"> <li>Study published</li> </ul>
Action O.1.3	Feasibility assessment to determine technically and economically viable waste-to-energy options for Palau, and define enabling environment to promote private sector investment.	Year 1 – Year 3	PPUC PEO, Pacific Power Associations	\$150,000	<ul style="list-style-type: none"> <li>Assessment completed</li> </ul>
Intervention O.2	Identify and evaluate options to address loss in electrical power transmission and distribution, illegal connections, and overall grid loss/efficiency.	Year 1 – Year 4	PPUC/PEO	\$350,000	<ul style="list-style-type: none"> <li>Number of pre-paid meters installed</li> <li>Arrears reduced</li> <li>Appropriate prepaid meter specs available</li> </ul>
Action O.2.1	Conduct an independent tariff review for PPUC including its outer island operations + for Independent Power Producers	Year 1 – Year 5	PEO NEC, PPUC, UNDP, IPPs	\$100,000	<ul style="list-style-type: none"> <li>Tariff regime including adjustment formula approved by OEK</li> </ul>
Action O.2.2	Regularly and automatically implement tariff adjustments as recommended in tariff study and also explore fuel price hedging	Year 1 – Year 5	PPUC NEC, PEO	\$100,000	<ul style="list-style-type: none"> <li>Response procedures published</li> </ul>
Action O.2.3	Develop and up-date an integrated system management and expansion plan for PPUC	Year 1 – Year 5	PPUC PEO, NEC, JICA	\$500,000	<ul style="list-style-type: none"> <li>Revised plan approved</li> </ul>
Action O.2.4	Upgrade PPUCs distribution system (including possible off-grid renewable energy)	Year 1	PPUC  PEO, NEC, JICA	\$20,000,000	<ul style="list-style-type: none"> <li>Improved and stable power grid for Babeldaob</li> </ul>
Action O.2.5	Promote and enhance academic, professional, and apprentice training and develop/exchange of technologies and technological information	Year 1 – Year 5	PPUC PPA, PCC, Equipment Suppliers, Palau National Scholarship Board	500,000	<ul style="list-style-type: none"> <li>Trained and qualified local mechanical and electrical engineers</li> <li>Improvement in performance of distribution system</li> </ul>
Action O.2.6	Create strong incentives and compensation to attract local employment	Year 1 – Year 5	PPUC/ PPA PPUC Board, Regional: FSM, RMI, Guam (Power Co.)	\$100,000	<ul style="list-style-type: none"> <li>Retain local skills and expertise</li> </ul>

Type of Strategy	Strategy	Time frame	Lead Agency Supporting Agencies	Cost	Indicators
<b>INSTITUTIONAL MECHANISMS FOR EFFECTIVE POLICY IMPLEMENTATION</b>					
<b>SECTION P: Necessary Institutional Framework and Climate Change Office</b>			<b>VISION: Palau's enabling framework for good governance (effective, transparent, accountable, responsive, well-coordinated) is established to build resilience to climate change and disasters and manage the transformation to a low carbon economy utilising traditional and elected governance systems.</b>		
Action P.i	Develop & Endorse CC Policy <ul style="list-style-type: none"> <li>Establish state gov't CC liaisons</li> <li>Establish CC Media Program</li> </ul>	Year 1	NEPC CC Ad Hoc Committee, Core Coordinating Group	\$1,600,000	<ul style="list-style-type: none"> <li>Policy is completed and endorsed by Senate</li> </ul>
Action P.ii	Ensure projects are in line with national priorities <ul style="list-style-type: none"> <li>Place CC Office in the Bureau of Budget and Planning</li> </ul>	Year 1	OERC MOF, Grants Office, MNRET	\$2,500,000	<ul style="list-style-type: none"> <li>Manual for Rules and Procedures for Project Management is completed and approved</li> </ul>
Action P.iii	Ensure program objectives are met <ul style="list-style-type: none"> <li>Establish linkages amongst line agencies and between line agencies and state governments, Communities, NGOs, private sector</li> </ul>	Year 1	MOF (Office of Project Mgmt & Performance and CC Office) Relevant executing agencies	\$100,000	<ul style="list-style-type: none"> <li>The Manual is being implemented as written</li> </ul>
Action P.iv	Ensure economies of scale and fiduciary integrity <ul style="list-style-type: none"> <li>Establish an oversight agency w/in Bureau of Budget &amp; Planning for project implementation</li> </ul>	Year 1	MOF, Grants Office	\$1,500,000	<ul style="list-style-type: none"> <li>Executive Order is issued, revising the organizational chart</li> </ul>
Action P.v	Undertake institutional and human resource capacity building <ul style="list-style-type: none"> <li>Hold gov't-wide training on new rules, procedures and tools/software</li> <li>Active engagement with state liaisons</li> <li>Obtain needed equipment and software for data mgmt. (e.g., computers, servers, establishing communications data systems, such as info sharing systems)</li> <li>Identify and obtain toolkits for management improvement</li> </ul>	Year 1	MOF (Office of Project Mgmt & Performance) and relevant agencies in national and state government	\$4,000,000	<ul style="list-style-type: none"> <li>1 training is completed</li> <li>At least 1 meeting with reps from all 16 states has taken place</li> <li>Hardware and software for each ministry have been installed</li> <li>Toolkit installed and training completed</li> </ul>

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## Appendix 3. Additional Background and Processes to Develop this Policy

Palau has been addressing issues related to climate change in its private and public sector planning for many years. The formal process for developing this Policy in its current state began in 2012 with an OEK House Resolution to develop a policy and action plan. That same year the Republic of Palau requested technical assistance and in 2013 a formal project to develop the Policy was initiated with funding support from the SPC and USAID. SPC funding was from the European Union-funded Global Climate Change Alliance Pacific Small Islands States Project (GCCA: PSIS) and the Coping with Climate Change in the Pacific Island Region program (CCCPIR) implemented in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

The OEK House Resolution called for the creation of a Climate Change Committee (called the Ad Hoc Climate Change Committee (AHCCC)) that would report to the National Environmental Protection Council (NEPC). The AHCCC through its secretariat the Office of Environmental Response & Coordination (OERC) retained the services of local and international consultants, including the Palau-based Sustainable Decisions, The Environment Inc., and Palau Conservation Society, New Zealand-based FCG ANZDEC, and United States-based D&D Biodiversity Consulting. Additional development partners included SPREP and the University of the South Pacific.

The AHCCC established 10 working groups to represent the following sectors:

1. Agriculture and Fisheries
2. Health
3. Finance, Commerce, & Economic Development
4. Biodiversity, Conservation, and Natural Resources
5. Critical Infrastructure
6. Utilities
7. Society and Culture
8. Good Governance
9. Education
10. Tourism

The process to develop the Policy was built on existing initiatives through a sector-based consultation effort to provide a framework for

a coordinated approach to building resilience to climate change and disasters and reduce greenhouse gas emissions. The process builds upon earlier work, and has been defined and developed through:

- (a) initial assessments of vulnerability and levels of greenhouse gas emissions conducted to prepare the *Palau Second National Communication to the United Nations Framework Convention on Climate Change*;
- (b) initial risk assessments undertaken to develop the *Palau National Disaster Risk Management Framework 2010*;
- (c) energy assessments undertaken as part of the process to develop the *National Energy Policy (NEP)* and the *National Energy Efficiency Action Plan 2010*;
- (d) sector risk and capacity assessments undertaken by sector working groups
- (e) national capacity assessments and definition of priority risks, gaps, and needs by the Ad-Hoc Climate Change Committee and other stakeholders.

The process included national level planning and meetings as well as sector-level assessments and focus group interviews that included input from all levels of society: government, non-government, and private; national, local, and traditional, and multiple representatives from communities.

Sector assessment tools were standard and followed generally tested and accepted methods from around the region and the world. A key tool was the “Caribbean risk management guidelines for climate change adaptation decision making” tool (Caribbean Community Secretariat, 2003), which guided assessments. Steps in the process included:

- Priority Climate Change Risk Assessments
- Sector Adaptive Capacity Assessments
- Capacity Assessments for Mainstreaming Climate Change
- A National Adaptive Capacity Assessment
- Community Engagement Assessment
- Standardized action-plan matrix
- Plus/Delta Evaluation

Assessments occurred during facilitated focus group sessions and from at least 20 confidential Key Informant Interviews. Through the process over 150 individuals provided input to the priorities in this Policy.

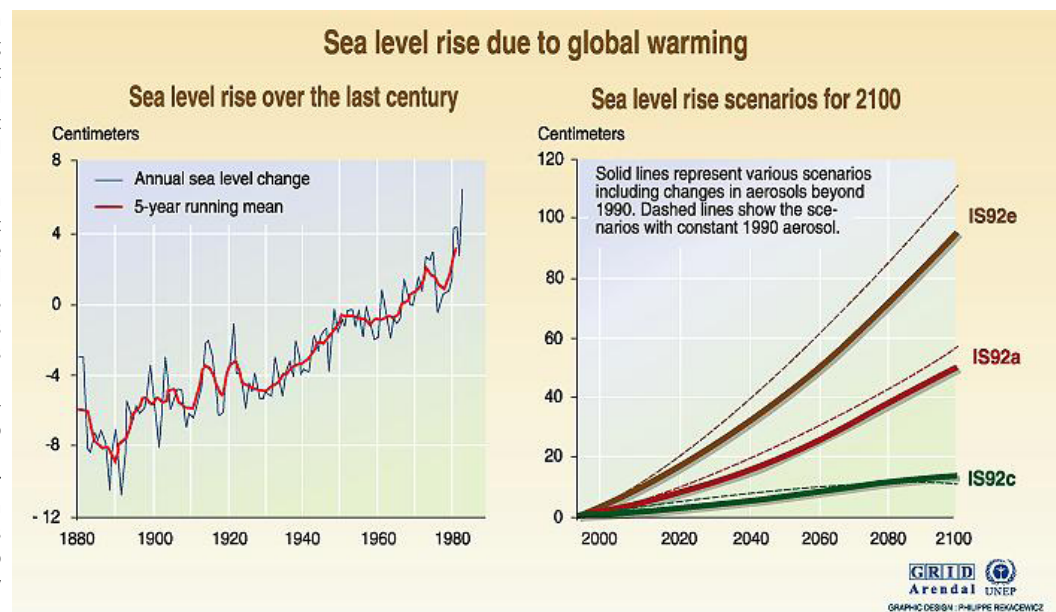
## Appendix 4. Causes and Mechanisms of Climate Change

### 1. Evidence for Climate Change and its impacts

The Inter-Governmental Panel on Climate Change (IPCC)<sup>1</sup>, the world's leading international scientific body for the assessment of climate change, releases periodic reports on the causes and effects of climate change. In the *Fifth Assessment Report* released in 2014, the IPCC reported that:

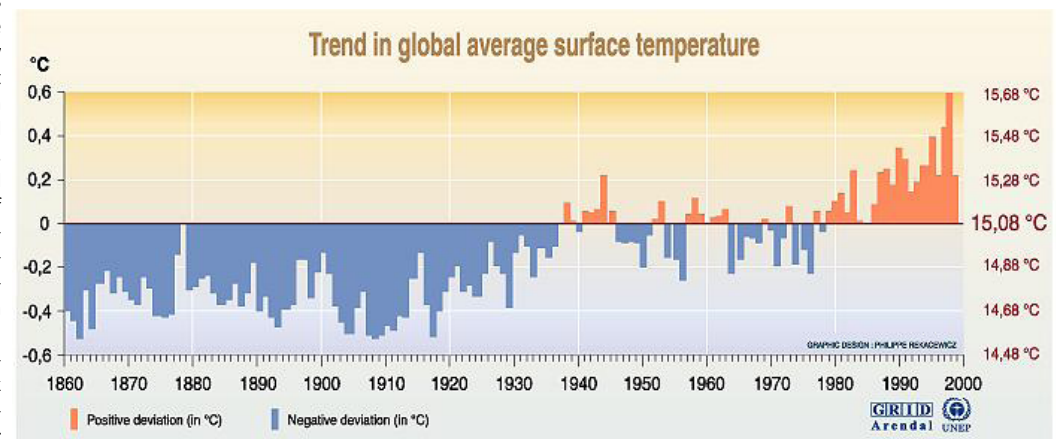
- Human influence on the climate system is clear, and recent anthropogenic **emissions of greenhouse gases are the highest in history**;
- Each of the **last three decades has been successively warmer** at the Earth's surface than any preceding decade since 1850;
- Recent climate changes have had **widespread impacts on human and natural systems**;
- Warming of the climate system due to human-induced greenhouse gases is unequivocal, and since the 1950s, many of the **observed changes are unprecedented** over decades to millennia - the atmosphere and oceans have warmed, the amounts of snow and ice have diminished, and **sea level has risen**;
- Changes in climate have caused **impacts on natural and human systems on all continents and across the oceans**.
- Since the beginning of the industrial era, oceanic uptake of carbon dioxide has resulted in **acidification of the ocean** - the ocean has absorbed about 30% of the emitted anthropogenic CO<sub>2</sub>;
- Greenland and Antarctic ice sheets have been losing mass, **glaciers have continued to shrink** almost worldwide, while Northern Hemisphere spring snow cover has continued to decrease in extent;
- In many regions, changing precipitation or melting snow and ice are altering hydrological systems, **affecting water resources in terms of quantity and quality**;
- Many terrestrial, freshwater, and marine species have **shifted their geographic ranges, seasonal activities, migration patterns, abundances, and**

1. The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. The IPCC is a scientific body under the auspices of the United Nations (UN). It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. It does not conduct any research nor does it monitor climate related data or parameters. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. The IPCC is an intergovernmental body. It is open to all member countries of the United Nations (UN) and WMO. Currently 195 countries are members of the IPCC. Governments participate in the review process and the plenary Sessions, where main decisions about the IPCC work programme are taken and reports are accepted, adopted and approved. The IPCC Bureau Members, including the Chair, are also elected during the plenary Sessions. Because of its scientific and intergovernmental nature, the IPCC embodies a unique opportunity to provide rigorous and balanced scientific information to decision makers. By endorsing the IPCC reports, governments acknowledge the authority of their scientific content. The work of the organization is therefore policy-relevant and yet policy-neutral, never policy-prescriptive.



Source: Climate change 1995, The science of climate change, contribution of working group I to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996; Sea level rise over the last century, adapted from Gornitz and Lebedeff, 1987.

Source: UNEP/GRID-Arendal



Source: School of environmental sciences, climatic research unit, university of East Anglia, Norwich, United Kingdom, 1999.

Source: UNEP/GRID-Arendal



**species interactions** in response to ongoing climate change;

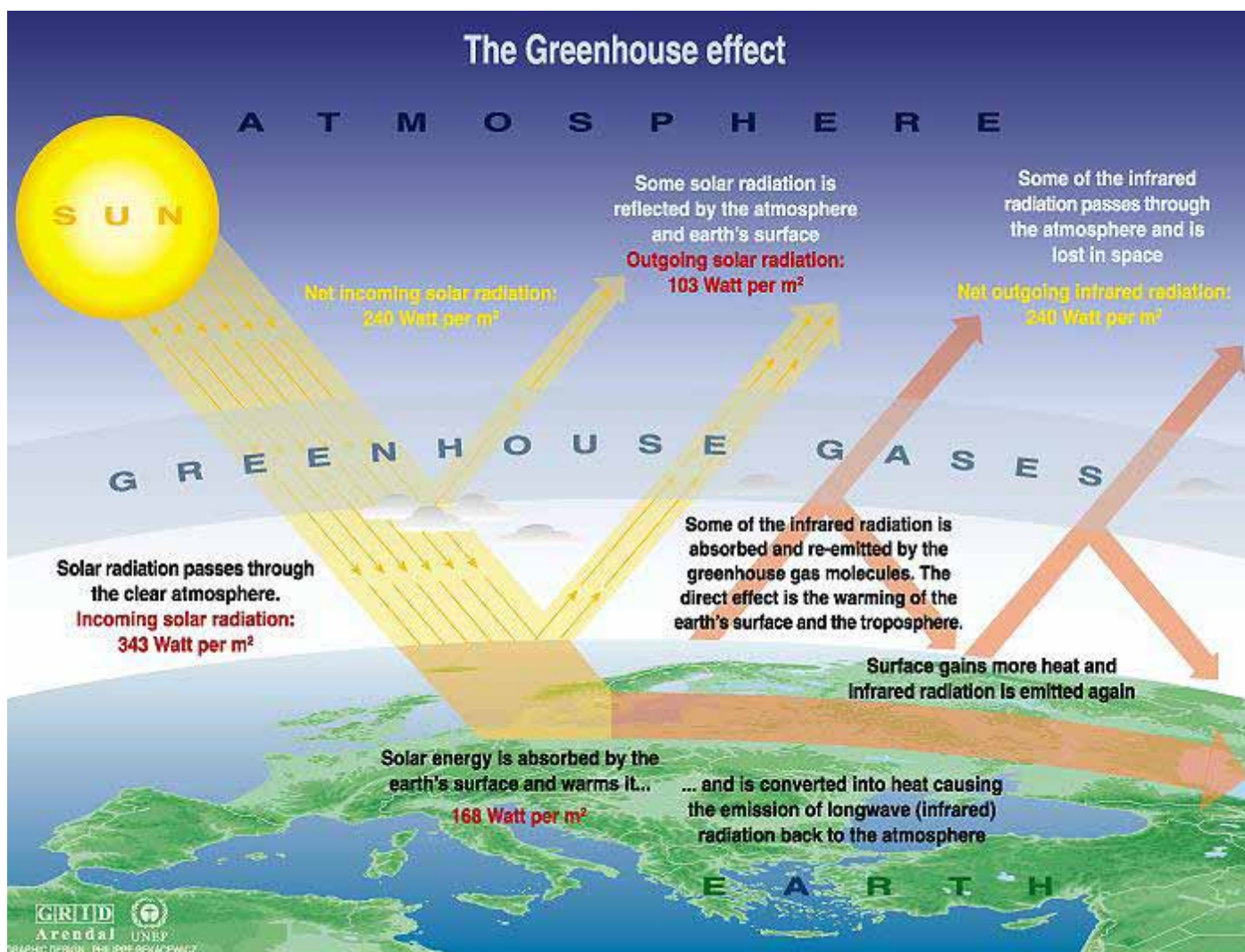
- Negative impacts of climate change on **crop yields and marine organisms** have been observed;
- Changes in many **extreme weather and climate events have been observed** - including a decrease in cold temperature extremes, an increase in warm temperature extremes, an increase in extreme high sea levels and an increase in the number of heavy precipitation events in a number of regions;
- **Climate change will amplify existing risks and create new risks for natural and human systems.**

## 2. Causes of Climate Change

- The 'natural' greenhouse effect makes life as we know it possible on Earth, without which the average global temperature would be about  $-18^{\circ}\text{C}$  rather than its current  $+14^{\circ}\text{C}$ . Earth's surface temperature is determined by the radiative balance, the net difference between the energy gained from incoming energy from the sun and the amount lost into space as infrared radiation. The Earth's atmosphere acts like a transparent blanket (or

greenhouse), letting in light but trapping some of the heat it generates. Without an atmosphere, all of this energy would be lost to space. This natural effect relies on 'greenhouse' gases in our atmosphere allowing sunlight to pass through, and trapping some of the resulting heat energy that radiates back up from the Earth's surface.

- Since the start of the Industrial Revolution in about 1750, human activities such as the burning of fossil fuels including coal and oil which emit carbon dioxide and other greenhouse gases, have dramatically increased the concentration of greenhouse gases in our atmosphere. As a result, the rate of heat-loss from the Earth has slowed, creating a warming effect. More than 85 per cent of the additional heat in our atmosphere is absorbed by the oceans. Concentrations of carbon dioxide in the Earth's atmosphere in 2013 was approximately 395 parts per million, and is now at a level higher than at any time over the past 800,000—and possibly 20 million—years.
- As levels of carbon dioxide and other greenhouse gases rise, the delicate chemical balance in the

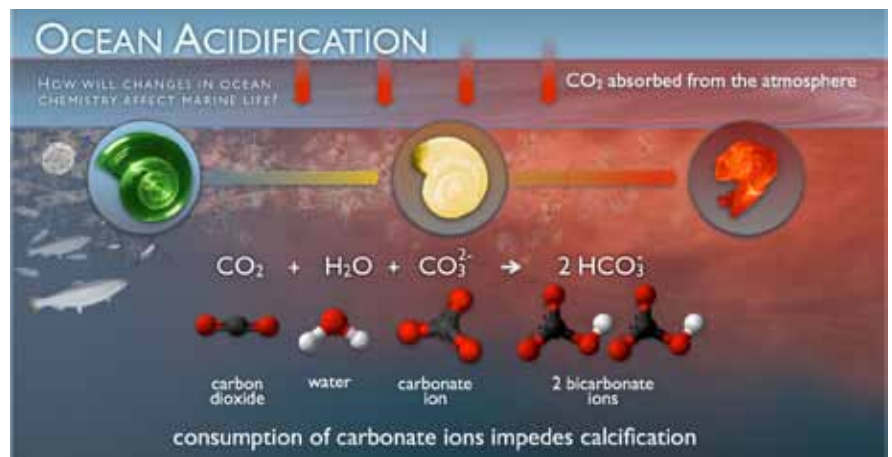


Sources: Okanagan university college in Canada, Department of geography, University of Oxford, school of geography; United States Environmental Protection Agency (EPA), Washington; Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996.

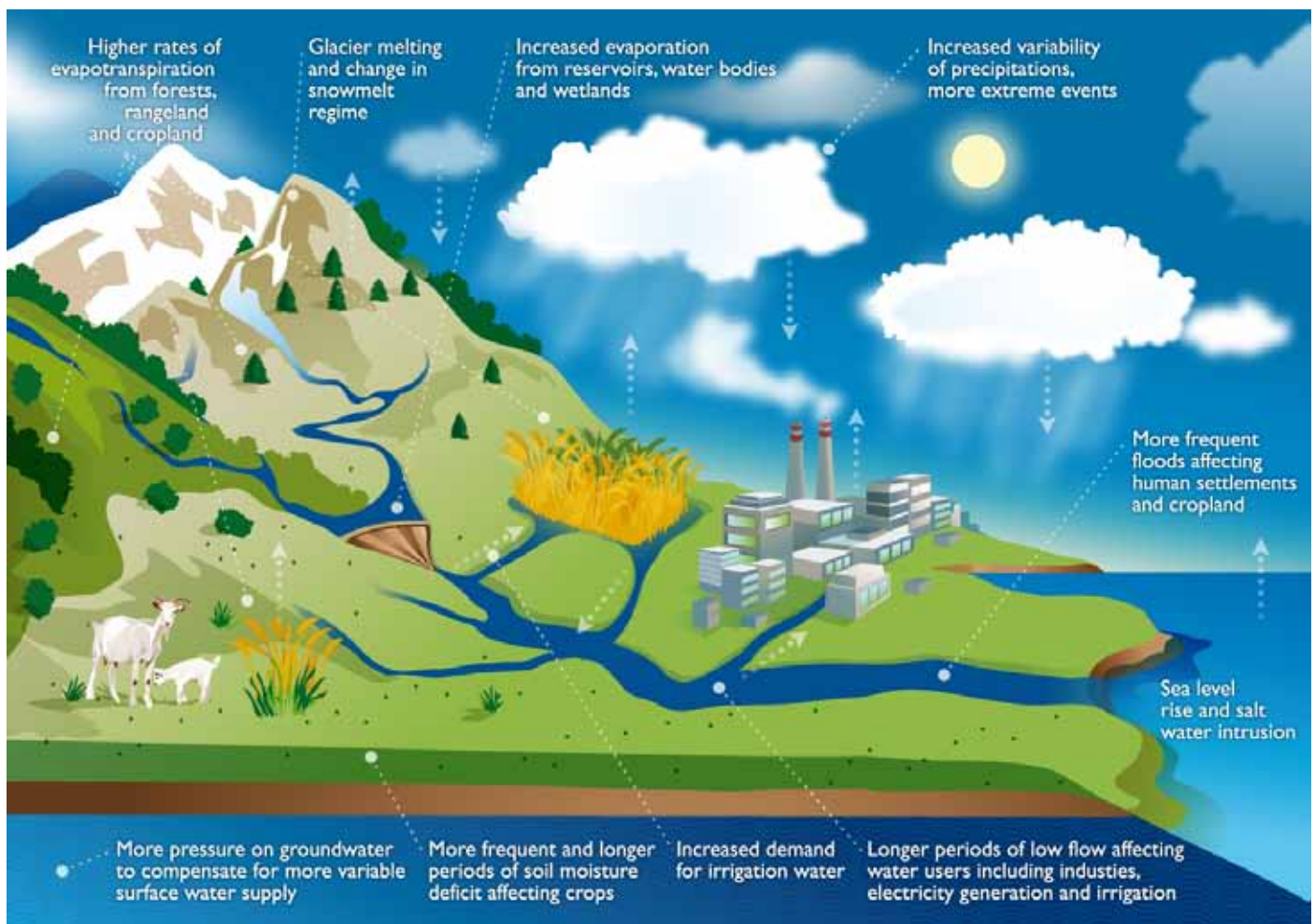
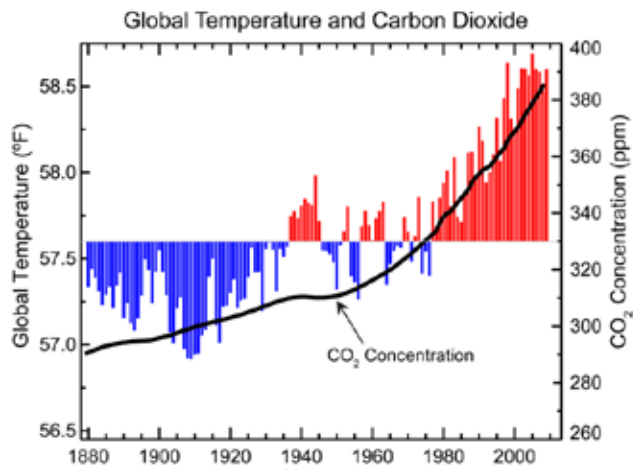
Source: UNEP/GRID-Arendal



atmosphere is affected, resulting in global warming that affects key elements of the climate. The enhanced greenhouse effect caused by increases in human-induced emissions of greenhouse gases is expected to change many of the basic weather patterns that make up our climate, including wind and rainfall patterns and the incidence and intensity of storms.



Source: Pacific Marine Environmental Laboratory/NOAA



Source: Food and Agriculture Organization (FAO)/UN

## Annex 5. Elaboration of certain Sector Risks

Several Sector Working Groups developed detailed information on the direct and indirect risks that climate change poses to their sectors. The main text of this Policy includes only the Priority Risks; however, this additional information is important for understanding the context for the priorities.

### Health Sector

*Priority Risk 1: Disruption of food supply/production systems, with increases in poor nutrition and non-communicable diseases (NCDs)*

- Impacts are poor nutrition *and* malnutrition.
- Particular concern is amongst vulnerable segments of society.
- Poor nutrition may arise from increased reliance upon imported processed foods and increased costs of food for community members.

*Priority Risk 2: Damage or destruction of infrastructure (water, sewage, power, health, etc.) and disruption in community health services*

- Damage and destruction to infrastructure may include damage to outdated health infrastructure as well as delivery of health programs.
- Associated increased health risks in community is of concern.

### Biodiversity Conservation & Natural Resources

*Priority Risk 1: Decreased resilience of marine resources and coral reef systems*

- Biological erosion is of particular concern.

*Priority Risk 2: Destruction and transformation of forest ecosystems*

- Of particular concern are old growth species and ecosystems in low-lying terrestrial ecosystems.

### Society & Culture

*Priority Risk 1: Negative impacts on traditional and subsistence food production*

- Of particular concern are traditional farms and taro patches (mesei) and fishing activities
- Subsequent impacts may include:
  - Community members unable to conduct traditional food production activities (farming and fishing), which reduces social interactions needed by communities, and
  - Communities becomes reliant on food imports rather than the traditional diet.



A taro patch in Kayangel at risk of salt water inundation and sea level rise © Carol Emaurois/PICRC.



*Priority Risk 2: Disruption of social units (families, clans, communities, cheldebechel, etc.)*

- Subsequent impacts may include:
  - clans/lineages/families (kebliil/telungalek/ongalek) disputes (particularly over land-use) occur because of displacement caused by storm surge, tension in the community rises over families that have to be accommodated at the community bai for extended periods of time;
  - clans/lineages/families (kebliil/telungalek/ongalek) are displaced and unable to establish/build homes and farms because land on coastline is lost to erosion or degraded;
  - immediate family tensions increase over roles and responsibilities during recovery after extreme event;
  - family members are separated from one another - individuals and immediate families lose their sense of belonging and security after extreme events that destroy large areas of the community;
  - destruction of tangible historical sites and traditional names of places (as well as the tangible places) on coastal areas lost, further eroding the sense of identity and belonging in community members;
  - vulnerable members within traditional communities more at risk from damage or destruction of property, injury and even death during extreme events, some communities are fragmented because traditional leadership is absent or divided;
  - increased incidents of deaths in community, which can erode social structure of families/lineages/clans;
  - conflicting perceptions of cultural and social understanding of personal property, space and access (i.e. foreign hotels refuse access to locals, etc.) affects ability to respond in times of extreme events.

*Priority Risk 3: Changes in social behaviour and migration patterns*

- Subsequent impacts may include:
  - increased out-migration causing loss of human, traditional and intellectual resources and fragmentation in families and communities;
  - increase in dependency on foreign labor to rebuild degraded/destroyed infrastructure and facilities, which can also result in loss of local skills;
  - shift in internal migration within Palau.

**Critical Infrastructure**

*Priority Risk 1: Damage or destruction to coastal infrastructure*

- Coastal infrastructure may include public infrastructure such as schools, hospital(s), and utilities, as well as private homes, etc.
- Subsequent impacts may include:
  - entire coastal villages/neighborhoods infrastructure damaged or destroyed;
  - infrastructure for local food production as well as important cultural facilities (farms, docks for fisheries, aquaculture, traditional waterways, etc.) damaged or destroyed;
  - tourism infrastructure (hotels, restaurants, etc.) destroyed or damaged due to location on vulnerable shorelines.

*Priority Risk 2: Higher costs for development and maintenance of public infrastructure*

- Of particular concern are poorly built and poorly maintained infrastructure

**Finance, Commerce, & Economic Development**

*Priority Risk 1: Damage and destruction to infrastructure, public facilities, and private and commercial facilities*

- Infrastructure includes in residential homes in low lying areas, roads, docks, utilities, farms (agriculture & aquaculture), national hospital, etc. public facilities, private commercial facilities, national hospital), due to sea level rise & storm surges.



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# Palau Climate Change Policy 2015