



# *Increasing Foresight, Building Resilience*

## A CASE STUDY:

The Implementation Progress Review of the *Republic of the Marshall Islands Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management (2014-2018)*

Pacific Resilience  
Program



PACIFIC ISLANDS FORUM



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The case study summarises the findings of the review of the RMI Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management 2014 – 2018 (RMI JNAP). The review was conducted by consultants Daniel Lund and Mosese Sikivou, from January to April 2018. The findings of the review became the core part of this case study. The consultants are employed through the PIFS-PREP project.

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## List of Acronyms

<b>CCA</b>	Climate Change Adaptation
<b>DIDA</b>	Division of International Development Assistance, Ministry of Finance
<b>DRM</b>	Disaster Risk Management
<b>DRM NAP</b>	Disaster Risk Management National Action Plan
<b>EPA</b>	Environmental Protection Authority
<b>EPPSO</b>	Economic Policy, Planning and Statistics Office
<b>FRDP</b>	Framework for Resilient Development in the Pacific: An Integrated Approach to Address Climate Change and Disaster Risk Management 2017 - 2030
<b>JNAP</b>	Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management 2014 - 2018
<b>MAWC</b>	Majuro Atoll Waste Company
<b>MEC</b>	Marshalls Energy Company
<b>MISC</b>	Marshall Islands Shipping Company
<b>MWSC</b>	Majuro Water and Sewer Company
<b>NCCF</b>	National Climate Change Policy and Framework
<b>NGO</b>	Non-Government Organisation
<b>NTA</b>	National Telecommunications. Authority
<b>OCS</b>	Office of the Chief Secretary
<b>OEPPC</b>	Office of Environmental Policy and Planning Coordination
<b>PICs</b>	Pacific Island Countries
<b>PIFS</b>	Pacific Islands Forum Secretariat
<b>PREP</b>	Pacific Resilience Program
<b>PREP RCU- PMU</b>	Pacific Resilience Program Regional Coordination Unit-Project Management Unit
<b>RMI</b>	Republic of the Marshall Islands
<b>SDGs</b>	Sustainable Development Goals
<b>UNDP</b>	United Nations Development Program





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## Executive Summary

**As a low-lying atoll nation, the Republic of the Marshall Islands (RMI) must contest daily with the social, environmental and economic implications of climate change. For RMI and other Pacific island countries (PICs), achieving national development objectives are highly contingent on the effectiveness of national climate and disaster risk resilience-building efforts. The success of these efforts are contingent upon, and defined by, the national capacity to anticipate change and respond pre-emptively, rather than reactively, to complex threats. The Government of RMI has taken steps to proactively review national progress against key climate and disaster risk policies and has actively sought strategies to better manage and reduce climate and disaster risks. This case study draws on the findings from a recent formal review of RMI's experience managing climate change and disaster events to identify key lessons and recommendations that are relevant to other PICs.**

In 2013, RMI developed a Joint National Action Plan for Climate Adaptation and Disaster Risk Management 2014-2018 (JNAP). This plan demonstrated an early effort to better represent and manage the impacts of climate change and disaster events on national development priorities. The plan and its intentions preceded the global milestones that further advanced the concept of climate-resilient development – such as the Paris Agreement, the launch of the Sendai Framework, and the articulation of the Sustainable Development Goals (SDGs). The Government of RMI requested the support of the Pacific Resilience Program Regional Coordination Unit-Project Management Unit (PREP RCU-PMU)<sup>1</sup> to undertake a review of the national progress against the JNAP in 2018, at the end of its intended implementation period and an important juncture in the evolution of RMI's climate change response.<sup>2</sup>

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<sup>1</sup> The PREP RCU-PMU is hosted within the Pacific Islands Forum Secretariat (PIFS).

This case study, prepared by the PREP RCU-PMU, summarises the findings of the 2018 review process. It concludes that although RMI's JNAP helped deepen national consideration of climate and disaster risks, progress against the JNAP goals was limited due to existing constraints and challenges.

Overall, the JNAP was widely perceived to have anchored RMI's development efforts in an improved level of awareness of the interrelated risks and opportunities that need to be considered as part of a system-wide approach to risk reduction. The JNAP's goals and objectives have helped guide both the development of new policies and the alignment of donor funding with national priorities. The JNAP also helped to identify the interrelated activities and stakeholders required to advance a more robust and collaborative approach to risk management. The key findings of the JNAP review and associated recommendations are summarised below:

### **1) UNDERSTANDING RISK – *Why are we doing this?***

A significant finding of the JNAP review was that the objectives of the plan and the premise for these objectives were based on generalised descriptions of possible risks and lacked consideration of the specific nature of the localised climate change impacts and implications that are likely to shape the interventions required by RMI. The description of climate trends, disaster risks and future projections in the JNAP and other related national policy documents are broad and would benefit from more detail on how risks will unfold. Due to these broad descriptions of risk, the objectives and activities set out in the JNAP were not defined in relation to a specific set of risk assessments or climate change scenarios. This resulted in various vague and unqualified targets and goals. Participants in the review process recognised that future policy would benefit from consensus around a minimum level of sea-level rise that should be anticipated and accounted for over a mid- to long-term time frame. This would help to legitimise the starting point for designing climate adaptation options and help to ensure that a plausible minimum level of risk was considered at the outset when updating development and disaster risk management plans. Without the integration of risk foresight, along with an understanding of risk trends, there is potential that future threats and conditions could be under-estimated or unexpected. A lack of specificity and consensus around long-term climate impacts can impair the effectiveness of adaptation investments, lead to inconsistent approaches to adaptation, and render ineffective certain large-scale investments based on incorrect assumptions.<sup>3</sup>

### **2) CONTEXT-RELEVANT APPROACH – *How will we do it?***

The development and implementation of RMI's JNAP provided insight into the practical challenges involved with a cross-governmental approach to climate and disaster risk management. The JNAP review process highlighted the need to ensure that investments made to increase resilience to climate and disaster risks take into account the factors that contribute to human well-being, specifically the importance of social preferences, cultural contexts, and the socio-economic factors that will determine the way long-term risks are managed in RMI. A greater emphasis and requirement to increase strategic co-benefits of investments, in keeping with the '*triple dividend of resilience*', was seen as a means to re-centre investment logic. At the same time, an emphasis on longer-term and larger development programs have the potential to improve efficiencies of scale and be used to improve efficiency through different sources of finance.<sup>4</sup>

### **3) INSTITUTIONAL OWNERSHIP AND RESOURCING – *Who is responsible?***

The review findings suggested that delivering the cross-sectoral objectives of RMI's JNAP was hampered by both the nature of existing institutional arrangements and lack of a dedicated budget to embed the JNAP's objectives into government programs and public service delivery. Due to the scale and increasing severity of climate change impacts and risks faced by RMI, stakeholders recognised that the way in which

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<sup>3</sup> Furthermore, some experienced impacts of climate change maybe be inconsistent or misleading of not considered over a longer timeframe. For instance, ocean warming is also expected to drive Skipjack Tuna eastward towards RMI waters potentially having a positive impact on RMI's commercial fishing industry in the short term whilst Big Eye tuna are likely to move further eastward, resulting in short and long term changes to RMI's income from fisheries.

<sup>4</sup> E.g. Phase II of the PREP Program combines IDA financing and grant finance from the Green Climate Fund.

government portfolios and responsibilities were divided often restricts the potential to advance the integrated approach called for by the JNAP. A further key outcome of the review was the recommendation that in some cases, roles, responsibilities and institutional arrangements may need to be revisited and strategically re-organised to better address the complex and multi-sectoral nature of these risks and to enhance the capabilities and oversight required to address them.

The *Framework for Resilient Development in the Pacific 2017- 2030 (FRDP)* and Pacific island country JNAP's call for an 'integrated approach' to climate and disaster risks. The FRDP was developed in recognition of the inefficiencies and risks involved with separating approaches and investment in development, climate change mitigation and adaptation, and disaster risk management. The FRDP describes the various considerations and stakeholders that should be taken into account, but in any case, the FRDPs approach must be translated into specific guidance for the national context. To translate the FRDP's approach to 'integration' into operational changes and strategies, greater efforts to improve foresight through the use of scenario analysis, governance reform, and strategic investments will help countries to better understand risk, increase the effectiveness of risk governance, and design effective investments that unlock co-benefits for people and economies.

The recommendations from the review of RMI's JNAP in 2018 and documented by this case study have been used to produce a '**Self-Assessment Tool**' (**Annex 1**) for supporting the strategic consideration of national approaches to climate and disaster risk management in the Pacific. Ultimately, this self-assessment tool is intended as a diagnostic exercise for governments to consider the relevance and technical basis of existing climate and disaster risk management efforts.





## Introduction

This case study draws on the 2018 review of the Republic of the Marshall Islands (RMI) Joint National Action Plan for Climate Change Adaptation (CCA) & Disaster Risk Management (DRM) 2014 - 2018 (JNAP), and the assessment of national efforts to address interrelated climate and disaster risks in one of the world's most climate-vulnerable countries. The findings presented are intended to help demonstrate how Pacific Island Countries (PICs) are working to tackle complex systemic risks through policy and how national planning and policy-making is changing as a result of growing social, economic, and climate change-related risks. The case study also provides useful lessons in support of national efforts to implement the principles and objectives of the Framework for Resilient Development in the Pacific (FRDP) across PICs.

PICs have an acute awareness of the importance of ensuring disaster risk management, climate change adaptation, and socio-economic development objectives are considered in concert within national planning processes. Since 2010, most PICs have launched joint national action plans to address the close inter-linkage between these objectives. Such plans support and protect existing national development objectives and are intended to help reduce the compartmentalisation of disaster risk reduction and climate change adaptation objectives, communities of practice, funding, and expertise.

To simultaneously achieve the Sustainable Development Goals by 2030, minimise the impacts of climate change, increase employment, and grow the economy, RMI faces a range of challenges which are articulated throughout the nation's national policy suite.

In 2011, the Government of RMI began work to integrate climate and disaster risk considerations into a single centralised plan. The task was to ensure that the methods and approaches set out by the plan would help RMI to better articulate and respond to the interrelated risks to health, water and food security, energy access, outer island well-being, and economic stability that climate and disaster risks pose. The Government of RMI launched its JNAP in 2013 which, like others launched in the Pacific region, sought to increase cross-agency collaboration and demonstrate the connectivity between sector risks and objectives. Pacific JNAP's have been recognised as an early step in the climate and disaster risk mainstreaming actions that ultimately led to the endorsement of the FRDP in 2016. This regional framework has been recognised internationally as the first regional framework to provide high-level guidance on the integration of climate and disaster risk management into development decision-making.

In 2017, as RMI's JNAP approached the end of its 2014-2018 lifecycle, the Government of RMI commissioned an external review to assess its implementation progress. The Pacific Islands Forum Secretariat, through the World Bank-funded Pacific Resilience Program (PREP), agreed to provide technical assistance to the RMI's Office of the Chief Secretary to conduct the JNAP review. This review has provided insights into the progress made against the six overarching goals of the JNAP. The JNAP review identified key findings and recommendations for enhancing national capacity for climate and disaster resilient development. This review helped to illustrate the efforts underway in RMI to translate the vision of the FRDP into national practice as well as the challenges involved with implementing the approach and actions defined within the FRDP.

## National Policy Context

RMI's JNAP promotes a collaborative national approach to managing and reducing climate and disaster risks. The JNAP focuses on the delivery of six Goals:

- 1. Establish and support an enabling environment for improved coordination of disaster risk management /climate change adaptation in the Marshall Islands*
- 2. Public education and awareness of effective climate change adaptation and disaster risk management from local to national level*
- 3. Enhanced emergency preparedness and response at all levels<sup>5</sup> within the Marshall Islands*
- 4. Improved energy security, working towards a low carbon future for the Marshall Islands*
- 5. Enhanced local livelihoods and community resilience for all Marshall Islands people*
- 6. Integrated approach to development planning including consideration of climate change and disaster risks [1]*

The JNAP calls for its goals and objectives to be represented within national and sub-national development plans, systems and processes. The JNAP provides detail on an approach for managing and reducing climate and disaster risks and is intended to help protect the progression of national priorities. In this way, it is a complementary rather than additional set of national commitments.

The JNAP's initial implementation period (2014-2018) has traversed multiple significant transitions in international policy that have had an impact on both the regional and national policy landscape. The shift from the Millennium Development Goals to the Sustainable Development Goals in 2015, the adoption of the UNFCCC Paris Agreement (2015) and introduction of Nationally Determined Contributions and National Adaptation Plans,<sup>6</sup> the launch of the Sendai Framework for Disaster Risk Reduction 2015 - 2030, and the capitalisation of new major climate change funds, have all led to alterations in national government activity and approaches to risk management.

RMI's National Strategic Plan (2015-2017) articulates five priority areas: 1) Social Development, 2) Environment, Climate Change, and Resiliency, 3) Infrastructure development, 4) Sustainable Economic Development, and 5) Good Governance. The Government of RMI has also supplemented its National Strategic Plan with Agenda 2020: A Framework for Progress. Agenda 2020 sets out a range of government reform priorities and recognises the need to strengthen governance systems in order to increase capacity to respond effectively to increasingly complex risks.

In response to growing disaster risks, RMI's Disaster Risk Management National Action Plan 2008 – 2018 was developed and was informed by extensive national consultations and stakeholder engagement over several months in 2007. In November 2010, a review of the Disaster Risk Management National Action Plan (DRM NAP) highlighted the need to incorporate the impacts and risks associated with climate change. RMI subsequently developed and endorsed a National Climate Change Policy and Framework (NCCF). The NCCF sets guidelines for addressing climate change through a collaborative approach to national priority areas.

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<sup>5</sup> 'at all levels' is a reference to the 33 municipalities of RMI and the relationship between central government, local government, and traditional leadership structures.

<sup>6</sup> At the time of writing RMI's first NAP was in development. Prior to 2018 – RMI's JNAP fulfilled the broad mandate of a national NAP.

A further dimension of RMI's development policy suite is the National Infrastructure Investment Plan. This sets out investment priorities which will underpin budgetary decision-making while efforts to review national legislation will continue to add relevance to the way existing plans and strategies have been developed and implemented.

These recent policies and plans, as well as new scientific assessments on atoll vulnerability to sea-level rise, contributed to the timeliness and relevance of the JNAP review. Due to the expansive scope and objectives of the JNAP, this review required a more or less comprehensive strategic stock-take of the majority of RMI's development objectives.

## National Context

The 29 atolls and 5 islands of RMI have a cumulative land area of just 181 square kilometres. The RMI has claimed an Exclusive Economic Zone of approximately 1.9 million square kilometres. RMI's economy is defined by its service sector (mainly government services) which constitutes over 85% of national GDP [2].

RMI has been heavily reliant on funding from the United States Government through a Compact of Free Association (ratified in 1986 and amended in 2003), which contributes to 45% of the nation's current GDP [1]. Ahead of the conclusion of RMI's current agreement under the Compact of Free Association with the United States in 2023, RMI has faced further fiscal uncertainty which has led to further pressure to diversify economic activities and achieve more with less.

High levels of out-migration and skills shortages in RMI continue to hinder development progress and contributes to the overall vulnerability of RMI. The limited infrastructure and opportunities to diversify economic and agricultural activities in this remote context have led to an increasing reliance on foreign aid and dependence on imported goods. This has allowed RMI to develop beyond the limits of the natural carrying capacity of the atolls.

The recognition of the need to link climate and disaster-related policy to more specific risk assessments, outlooks, and assumptions is increasingly a common challenge for highly vulnerable countries and regions. Science-driven 'climate change' scenarios, such as those developed by the Intergovernmental Panel on Climate Change, form the backbone of global climate change projections and use educated projections and extrapolations around the socio-economic factors which will in part define future global emissions levels. These scenarios are conceived at a very high resolution and must be translated and combined with the consideration of various national and local factors to inform and support the practicalities of government planning and investment. Due to the complexity involved with downscaling global climate change projections to island scales and the difficulty of modelling highly-volatile ocean-climate interactions, building robust localised climate models in the Pacific can be problematic [3]. However, this uncertainty should not be accepted at the cost of practicality. In many cases, there is enough information to make sound estimations or at least reduce the risk ranges that are often referenced within national climate change policies.

Various regional assessments indicate a trend of land and ocean warming. For example, the Australia Bureau of Meteorology [3], concludes that there is 'very high confidence' that land air temperature and sea-surface temperature will continue to increase in RMI along with the intensity and frequency of days of extreme heat. Natural climate variability in RMI is driven by the El Nino Southern Oscillation (ENSO) which has a major impact on rainfall patterns in the North Pacific. ENSO fluctuations are likely to be impacted by increased sea surface temperatures in the region and will likely intensify the phenomenon leading to a greater chance of extreme rainfall events and drought periods. Various models and projections expect both annual and seasonal average rainfall in RMI to increase (high

confidence) [3]. Ocean acidification is projected to intensify as the ocean around RMI warms [3]. Continued ocean acidification risks further degradation of the natural coastal protection provided by coral reefs which naturally reduce coastal impacts as they serve to dissipate storm wave power and reduce wave height dramatically.

There is 'very high confidence' that mean sea-level rise will continue to increase under low, medium and high emissions pathways. Sea-level rise is higher than the global average in this region and is influenced by ENSO.

RMI is highly vulnerable to sea-level rise and coastal inundation events with 99% of RMI's population of approximately 53,000 living in areas with an elevation of less than 5 metres above sea level. Sea-level rise and the rate at which it occurs will have a significant bearing on the future of RMI.

Based on very conservative projections, by 2080, RMI is likely to experience a 50 cm rise in current sea levels which would result in the loss of 80% of the habitable land area of Majuro atoll [4] home to 70% of RMI's population [5].<sup>7</sup> More recent projections suggest that the same 50 cm increase in sea level could occur as early as 2050 [6] and suggest sea levels could rise by over 1 metre under a worst-case scenario by 2100 (more than double the high-end SLR risk described by the JNAP in 2014) [7]. The infrastructure requirements would vary drastically between these scenarios as would the resulting socio-economic implications for life in RMI. Across the literature available, there is consistent agreement that the costs of coastal protection will be the highest adaptation consideration for PICs and atolls. Despite uncertainty around time frames and scale of the sea-level rise and storms, it is clear, due to RMI's sensitivity to climatic change, that even under a future low emissions pathway and radiative forcing from historic emissions alone will require significant investment in adaptation to avoid major losses.

Increased hydro-meteorological extremes in the form of extreme rainfall and extended drought periods are a major challenge for atoll nations. RMI experienced an extended drought between 2015 and 2016 driven by an intense El Nino event resulting in USD4.9 million [8] in economic losses due to disruptions to national production and higher production costs. The social impacts and economic losses were felt across agricultural, education, industrial, electricity, water, sanitation, commerce and transport sectors. Increased rainfall and higher temperatures are also predicted to create favourable vectors for water-borne diseases. Floods and inundation risk linked to heavy rainfall and tidal variations will continue to impact upon the populations of RMI's atolls (See **Annex 2** for information on the key risks and threats as well as potential responses developed during the JNAP review).

Financial uncertainty and ongoing exposure to global market volatility have, along with climate change, continued to challenge long term planning in RMI. However, based on climate change projections, probable climate risk scenarios, and a range of technical cost-benefit analyses conducted in RMI in recent years, it is clear that the economic case for investing in climate and disaster resilience is unquestionable. In terms of the benefit to cost ratio, investment in RMI is likely to fall within the highest ranges of global assessments at about 60:1 [9].

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<sup>7</sup> Catastrophic risk modelling for RMI in 2011 predicted that over a 50 year period there is a 50% chance of RMI experiencing losses from a natural disaster event that will exceed \$53m and 10% chance of experiencing a loss exceeding \$160m (World Bank, 2011)



## Review Methodology

The review process used the following methods for assessing the national implementation of the JNAP:

**Literature Review:** Extensive analysis of relevant Government plans and policies, as well as third party technical reports, reviews and analysis was conducted. The literature review also drew on relevant regional reports and international frameworks to inform the contextual basis of the review.

### **Consultations:**

*One-on-One Consultations with National Stakeholders:* Consultations were held with Government institutions, local government, non-government organisations (NGOs), community groups, resident international organisations, academia and the private sector to inform a detailed understanding of progress made on a sector by sector basis. Over 100 individuals were consulted.

*One-on-One Consultations with Regional and International Stakeholders/Donors:* Consultations with regional and international stakeholders were held to assess experiences supporting JNAP objectives and work-streams.

*High-Level Briefings:* High-level briefings to relevant committees and government officials within the Government of RMI were held to inform potential next steps. Members of the National Disaster Committee and *Tile e Tile eo*<sup>8</sup> were engaged during a joint meeting held on 5 February 2018.

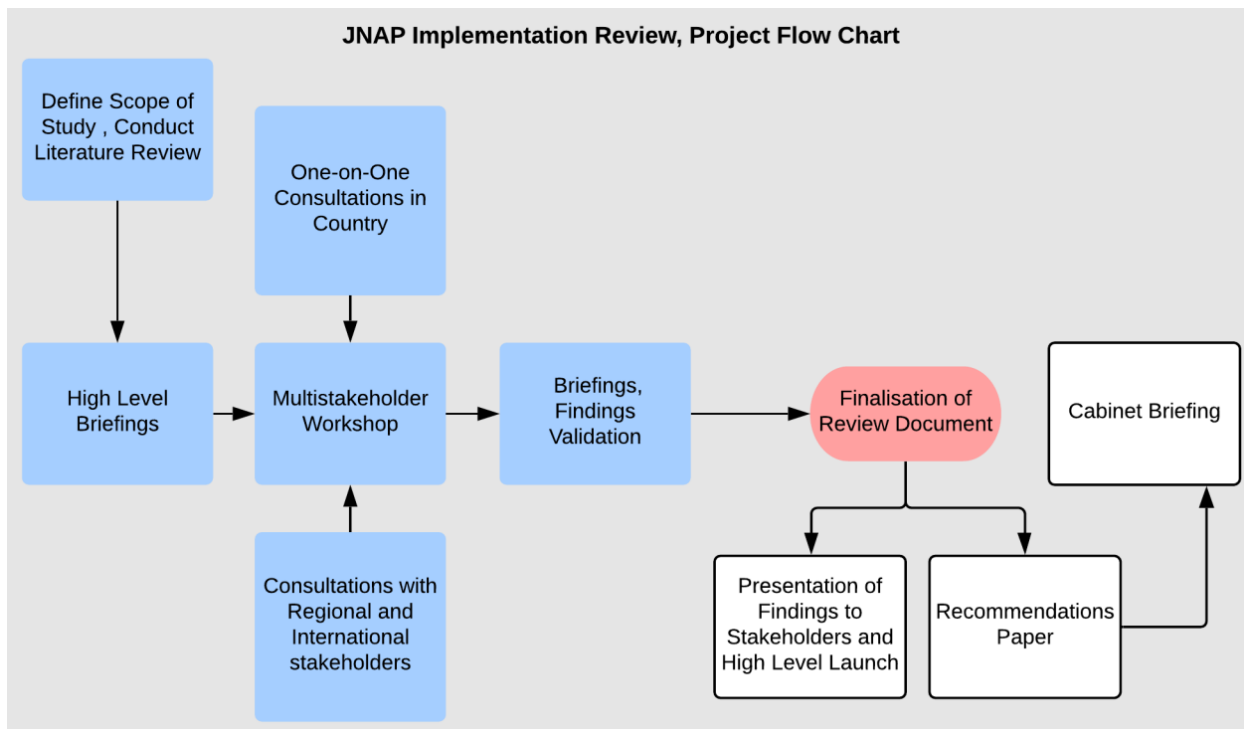
*Multi-stakeholder Workshop:* A two-day multi-stakeholder workshop was held from 6 - 7 February 2018. The workshop brought together a range of government officials, sector representatives, and non-state actors to discuss national progress against the JNAP and help inform and verify consultation findings. This workshop also discussed the concept of 'resilience' as a lens for capturing and combining national objectives linked to CCA, DRM, environmental protection, sustainable development and the reduction of greenhouse gas emissions.

The flow chart (Figure 1) shows the relationship between activities and consultations.

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<sup>8</sup> A national committee established by the RMI President in 2017 to oversee the implementation of RMI's Nationally Determined Contributions and the development of a 2050 Climate Strategy

Figure 1: JNAP Implementation Review - Project Flow Chart



## Key Findings and Recommendations

Evaluating the impact and effectiveness of the JNAP required consultation with a range of different actors and stakeholders. The consultations evaluated both the legitimacy and credibility of the JNAP’s intentions as well as the degree of progress made to implement the plan.

Overall, the JNAP was widely perceived to have anchored RMI’s development efforts in an improved level of awareness of the interrelated risks and opportunities that need to be considered as part of a system-wide approach to risk reduction. The JNAP’s goals and objectives have helped guide the development of new policies and the alignment of donor funding with national priorities. The JNAP also helped to identify the interrelated activities and stakeholders required to advance a more robust and collaborative approach to risk management.

The JNAP review process and final report produced recommendations based on specific challenges. Three specific findings and recommendation areas relating to the rationale (why), responsibilities (who), and approaches (how) in the JNAP are described in the following sections.

## 1) Understanding Risks: *Why are we doing this?*

**Key Finding: The JNAP lacks detail on the specific risks it set out to address.**

The JNAP and associated policy documents did not include a clear vision of how external and internal threats and risks have been understood and used to design the proposed responses. Without a clear representation of the degree and scale of potential risk faced by RMI, it was difficult to evaluate and understand the legitimacy of the responses and objectives offered. This, in turn, negatively impacted the potential and motivation to progress implementation of the plan.

RMI's National Strategic Plan (2015-2017), NCCF, JNAP and Agenda 2020 all provide complementary overviews of the broad objectives associated with protecting social and economic development from the adverse effects of climate change. Upon reviewing these goals and progress against them, it is evident that the degree of risk faced by RMI requires a much more granular and specific articulation of anticipated impacts to improve the specificity of the actions required to build climate and disaster resilience.

The JNAP was designed in relation to a fairly open range and description of future risks. For instance, the risk context section within the JNAP states that sea level in 2090 is projected to be 0.2 to 0.6 metres higher than in 2000. This risk range does not offer detail on the different potential socio-economic implications involved with the high or low end of this projection. There is also no inclusion of any nearer-term sea-level rise projections to help guide immediate risk mitigation efforts. Without detail on the probability and factors that will define either end of the range, it is difficult to understand the validity, rationale, and technical credibility behind the interventions set out by the plan or whether the plan in totality is designed in relation to the high or low end of the risks it describes.

Though technical uncertainty around the rate of sea-level rise exists, when considering the sensitivity of RMI to even the lower end sea-level rise projections, it is clear that RMI must contend with major implications under any and all scenarios. Recent literature has clarified that despite differing SLR projections and the deviations between them, it is important for policymakers to remove the emphasis on uncertain ranges and create consensus around a specific credible projection which could then be referenced by diverse users as an agreed benchmark for technical design and planning [10]. In addition to a lack of specificity concerning certain risks, it is unclear whether the JNAP's approach has considered how different climate risks may interact.

In reviewing the JNAP it was important to understand the specific assumptions, benchmarks, and socio-economic factors that shaped the activities and budget it presents. An understanding of how different potential risks and their interaction has been considered is deeply important as a starting point for assessing the legitimacy of climate and disaster risk policies [11].

To advance a more coherent understanding of the degree and nature of climate and disaster risks and produce an achievable theory of change, the review process concluded that greater consensus on future risks and increased efforts to improve risk foresight is required.

## Recommendation: Increasing Strategic Risk Foresight

**The ‘integrated approach’ of Pacific JNAPs to climate, disaster and development risks could be greatly improved through the use of scenario-building and analysis as a means to inform the design of national risk management strategies.**

The FRDP emphasises the need to improve understanding of how different social and environmental factors will interact. For a policy or plan focused on managing future risks to be effective, JNAP review participants agreed that it was important for that policy or plan to be firmly rooted in a clear understanding of potential and probable risks. Though policy and plans may not be the place to present complex science and projections, there is a need to ensure that the content of policy is evidence-based and has considered the way different climate impacts, events, and socio-economic conditions are likely to inter-relate.

There is a range of tools to help improve the understanding of potential future risks to well-being and help to improve ‘foresight’. These tools can support the management of uncertainty [12]. ‘Futures’ studies generally can be heuristic tools for exploring possible and preferable futures through the active consideration and analysis of different potential future states. One example of a ‘foresight enhancing’ tool is scenario building. Scenario building exercises, unlike traditional modelling exercises, can be used to overcome critical data deficits by helping users to consider various potential alternatives and, through comparative analysis, help them to arrive at a more educated and evidence-supported estimation. Scenario-based planning exercises use plausible stories about the future, based on available data and modelling, to explore future states based on different variables and the consideration of different drivers. Scenario-building exercises have been used to inform various strategic interests and exercises which involve high levels of uncertainty such as national defence strategies, market outlooks, long-term business plans, and public policy development. Scenarios are ‘stories of the future’ which describe a potential sequence of events. Scenario-building exercises can be an important tool for supporting decision-making, especially in relation to critical investments.

The World Bank has coined the concept of ‘*decision making under deep uncertainty*’ and suggested approaches to investment that involve the comparison of high, medium, and low-cost options with different risk level considerations. The World Bank’s ‘*Pacific Possible*’ study has also focused on improving foresight by asking ‘*What’s possible for Pacific Island Countries by the year 2040?*’ The governments of Singapore, the United Kingdom, United States, to name a few, all have departments or resources dedicated to advancing the national foresight needed to help improve policy legitimacy and account for future risks. Scenario-analysis has been increasingly integrated into the planning process in countries facing high risk and crisis [13]. National scenario-analysis can help with the conversion of technical and complex information (and global climate projections) into accessible and practical narratives and strategies [14].

This functionality would seem to be of particular value in the Pacific where climate projections and ranges are not useful for the decision-making, due to the resolution at which they are conceived and the uniqueness of the geophysical attributes of PICs [6]. Technical scenarios and models have been developed by governments at the national level to help directly determine appropriate climate adaptation methods, mitigation policies, and shape investments [15].<sup>9</sup> Scenario-building has also been found to be an effective tool for anticipating and shaping the approaches required to manage the

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<sup>9</sup> For example, Singapore Government’s ‘Centre of Strategic Futures’ (an extension of the Prime Minister’s Office) has developed a set of scenario building tools to help the policy makers explore ‘emergent, sudden, and discontinuous trends’ [43], The Fijian Government’s National Climate Change Policy 2018-2030 calls for the development of integrated national risk scenarios to help shape the Government’s overview of key trends, risks, and opportunities.



differing motivations, responsibilities, capacities, and agency of the diverse range of actors required to progress effective climate change adaptation and mitigation priorities [16].

To build insightful future scenarios at any scale, there is a need to draw on ‘best guesses’ in the absence of data or empirical evidence. Much of the value in scenario building exercises is the ability to draw on the views of a diverse range of stakeholders and expertise to explore the future potential and improve foresight. In this way, there is an opportunity to combine various types of localised data, subjective views, global trends, and potential externalities to test policy assumptions and challenge decision-making. Without a framework for understanding the way different drivers of change will define and influence the future there is a risk that public policy development could severely underestimate or misconstrue risk and fail to identify key opportunities.



Figure 2: 'Three families' of 'climate-related scenarios' [17], illustrating the relationship between the consideration of climate impacts, socio-economic variables, and global GHG transition trajectories.

Foresight and scenario-building exercises can help users to interrogate and explore future opportunities and risks and can be prompted and initiated by key questions. For instance, in relation to current and future climate and disaster risks, the RMI could develop scenarios around two general questions – a) ‘what would happen if we did nothing?’ and b) ‘what would a climate and disaster-resilient future look like?’. The JNAP review process concluded that the JNAP itself was an important starting point for considering these questions, however, overall the plan required more tangible connectivity between a vision of potential risk and the tools and methods needed to mitigate the full range of interrelated risks involved. In addition, there is a need to better consider national development goals and the appropriate pathways to achieving them in light of current and future risks.

## How to Implement?

Future climate and disaster risk policy in RMI should be shaped by a more expansive pre-policy development process. This process should be centred around the development of different probable, possible, potential and preferred scenarios that take into account a range of key determining factors such as:

- 1) The nature, scale, and timeframe related to climate change impacts
- 2) The nature, scale and frequency of disaster events
- 3) The sources and rate of economic growth
- 4) The nature of technological change
- 5) Migration dynamics and the impact of changes on social and cultural structures
- 6) The degree to which governance can adapt to changing service delivery requirements

The consideration of these factors and more broadly the interactions between social, economic, and ecological systems will continue to be important for defining RMI's long term climate adaptation and disaster risk reduction strategies.

Investments and actions to manage issues such as sea-level rise must be designed around a specific future scenario or set of assumptions to be effective and justified. Where interventions should be targeted is also dependent on population trends, land-use decisions, and various factors that must be quantified through risk assessment and cost-benefit analysis. The JNAP review concluded that, at the very least, nations highly vulnerable to sea-level rise should agree on a *minimum future estimate of sea-level rise* to help guide infrastructure investments (See **Annex 3**).

*National policy must be accountable to a range of different potential climate futures. Figure 3: Majuro Atoll in 2050 under a conservative SLR projection (red=land at risk). Figure 4: Majuro Atoll in 2050 in a high-risk future sea-level risk scenario (red= land at risk) [18].*

Figure 3



Figure 4

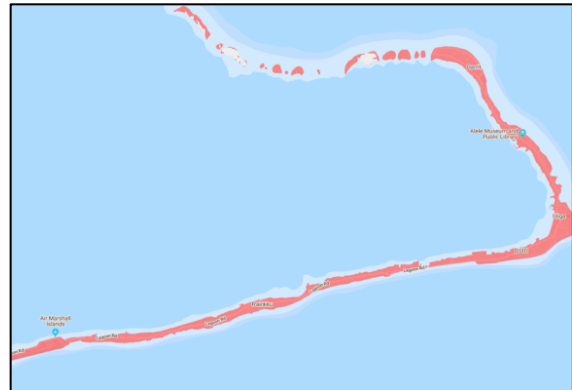
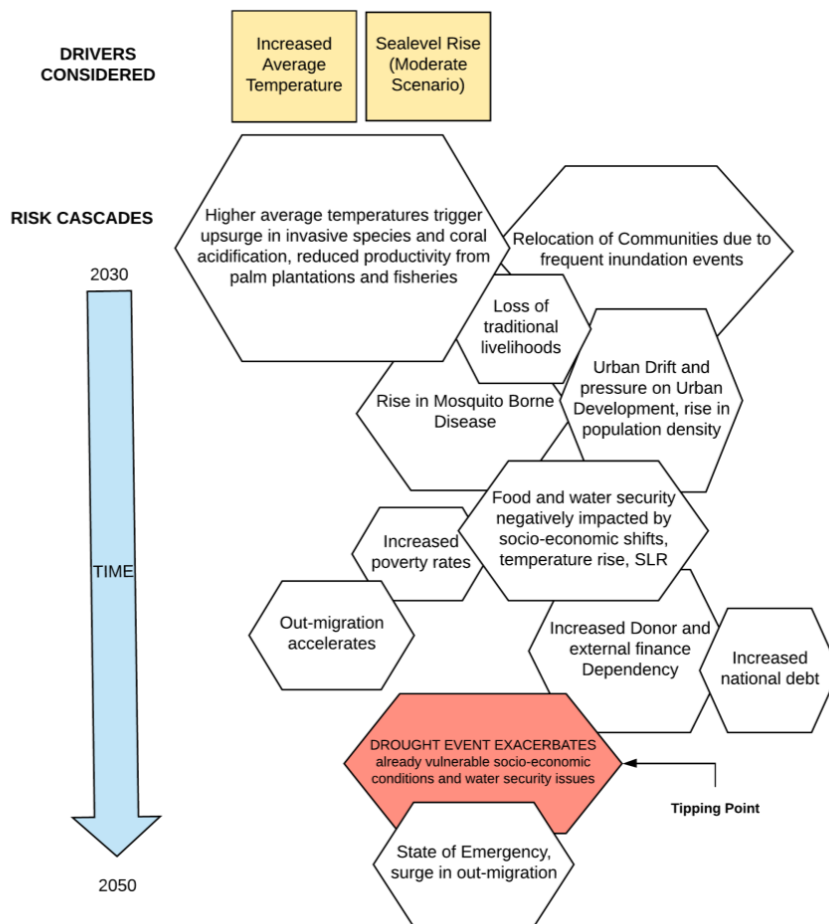


Figure 5: An example of a cause and effect scenario exercise. Basic cause and effect analysis can help to raise awareness of less obvious relationships between risk drivers and risk implications. The graphic below is a visualisation linking conversations conducted during the JNAP review process (Lund,2019)



## 2 ) Applicability and approach: How will we do it?

**Key Finding:** While RMI’s JNAP provides detail on the types of activities and issues that must be addressed, it provides little methodological guidance on how to prioritise investment.

The lack of detail on *method* within the JNAP was partly attributed to how the plan was developed. The JNAP was produced through a ‘*gaps analysis*’ exercise and is comprised of a combination of the pre-existing goals cited by the National Climate Change Framework and National Action Plan for Disaster Risk Management 2008 - 2018. Thus, there is much duplication of objectives across the goals and limited evidence of efforts to synthesise or clarify the underlying objectives. On reflection, participants in the JNAP review recognised that the integration of disaster risk and climate change objectives had been too literal (with goals drawn directly from respective plans). A more strategic review of how different objectives could be combined and complemented would have improved the specificity of the objectives and indicators included within the plan (See **Annex 4** for examples).

To some degree, this issue can be attributed to a lack of a *theory of change*<sup>10</sup> within the JNAP. Despite its progressive intentions, the plan provided limited guidance on how the broad activities and

<sup>10</sup> A ‘theory of change’ is a comprehensive description of why change is needed and how the desired change will be achieved. A theory of change can be illustrated in the form of a statement or diagram showing the way in which different activities will produce outputs that support outcomes that contribute to key objectives.

objectives could be progressed given the range of actors involved. This detracted from the overall understanding of the JNAP's benefits and lessened the incentive to fund or champion its message. Even with uncertainty around climate models, there is little uncertainty as to the nature of the climate impacts as sea-level rise, ocean acidification and changing rainfall patterns are already being experienced. As a result, the context calls for investments in climate and disaster resilience at a greater and more transformative scale (atoll-wide). It also requires greater efforts to integrate climate and disaster risks into macro-economic planning.

RMI's sensitivity and vulnerability to climate and disaster risks requires major strategic adaptation decisions in order to have any lasting impact on national climate and disaster resilience. To date, investment in climate adaptation has mostly been made through ad-hoc pilot projects (small localised projects). Though many of these projects have been useful ways to explore options, most of these investments have had a marginal impact on national climate and disaster resilience.

### **Recommendation: *Well-being as an investment objective and dividend***

**A central focus of adaptive management efforts on the protection and influence of human 'well-being' was deemed by JNAP Review stakeholders to be the most appropriate way to effectively consider and vet investments and the approach and impact of activities.**

To move the JNAP results matrix from a listing of required CCA and DRM actions to a more strategic summary of the actions that will support the key objectives of the plan, there is a need to better articulate what the integrated consideration of climate change adaptation and disaster risk management would mean in practical terms. JNAP review participants recognised that the objectives articulated by the JNAP were only valuable if the intention of the plan could be translated into a new approach to how activities were implemented.

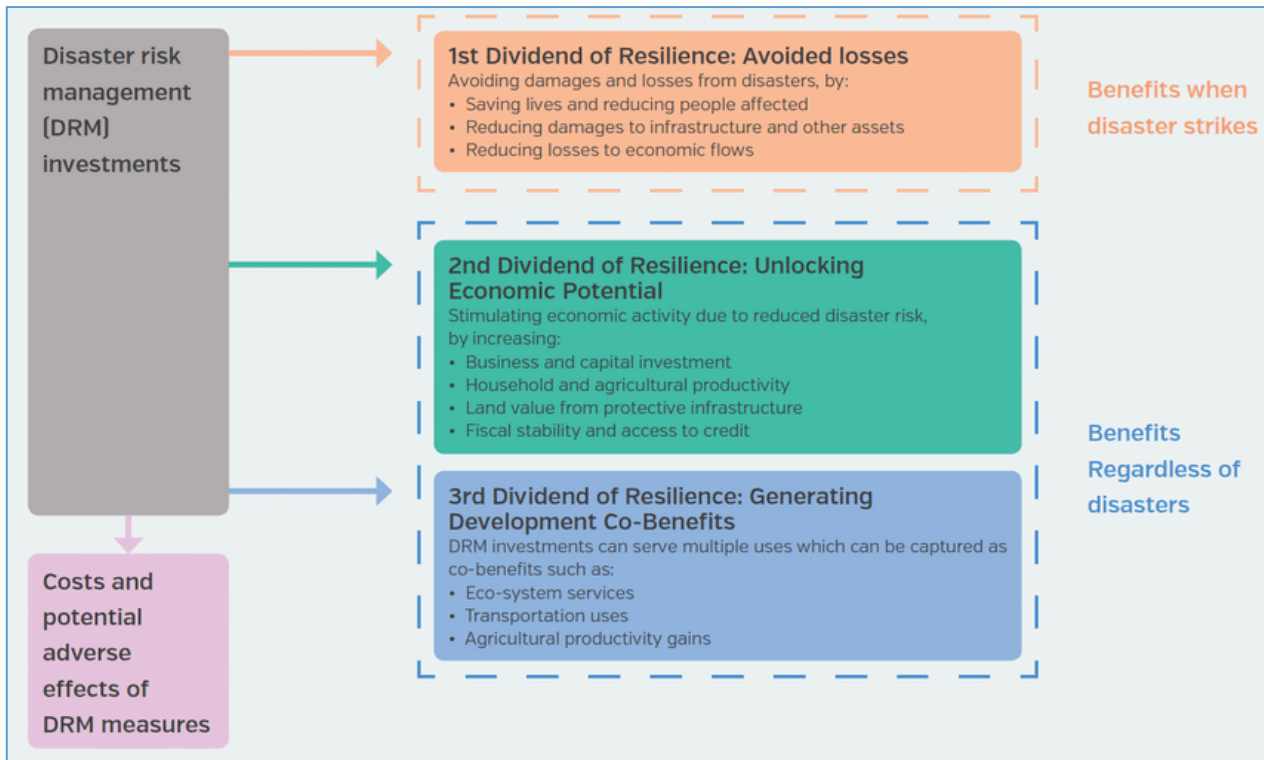
While there are various risks, external factors, development challenges, actions, methods and activities to consider in relation to climate and disaster risks and impacts – the ultimate indicator and measure of the success or failure of risk management interventions is the effect on human well-being. Recent studies have concluded that despite the importance of science and evidence in shaping adaptation options, human preference, perspective, and agency is just as likely to determine the outcome and success of adaption measures [19]. Furthermore, 'value-based' and highly localised and context-oriented approaches to achieving development goals are perceived to be of particular value in PICs [20].

Stakeholders involved in the review recognised practical approaches that should be introduced given the limited critical infrastructure in RMI, concluding that greater efforts must be made to reduce single point vulnerability (airport, water and power infrastructure) through the development of greater infrastructure redundancy and decentralisation where possible. In addition to assessing the financial costs of retrofitting key vulnerable infrastructure, there was also a clear need to assess public service provision at the systems level to assess ways to increase the resilience of supply chains, energy distribution, outer island transport services, airport infrastructure, water services and roads. These system-wide investments were seen to have potential complementary benefits for the achievement of the SDGs, protection of existing economic activities, and the unlocking of new economic potential.

The investment rationale for building climate and disaster resilience in RMI and the need to prioritise the protection of a highly vulnerable population provides a strong supporting example of the concept of the 'Triple Dividend of Resilience' [21] which is the logic for identifying investments that simultaneously help to reduce risks and losses, protect and bolster economic opportunities, and unlock co-benefits.



Figure 6 : The 'Triple Dividend of Resilience Concept', Image by [22]



Due to the small population and limited land area involved, the high-risk exposure profile, and closely interconnected nature of RMI's culture, economy and environment, there is a strong rationale to increase focus on the drivers and determinates of human well-being and to perceive well-being benefits as a key dividend derived from strategic investment. When seeking to target more transformative and integrated climate and disaster resilience-building programs and investment strategies, a greater emphasis on non-economic benefits and valuing of the prevention of both economic and non-economic losses should be increased.

### How to Implement?

To better consider strategic entry points for influencing and protecting well-being in RMI, the government should improve the direction of the various distinct donor-funded projects through common implementation indicators around human well-being. Securing large-scale investments in transformative projects will require a greater understanding of how human behaviour and preference will change and evolve under different risk scenarios and around different types of adaptation interventions. This requires an improved framework for monitoring human well-being and preferences to improve the oversight and ability to strategise the use of available funds in a complementary way. To achieve the 'triple dividend of resilience' and ensure efficient returns on investment, specific and context-relevant 'dimensions of well-being' [20] in RMI should be developed.

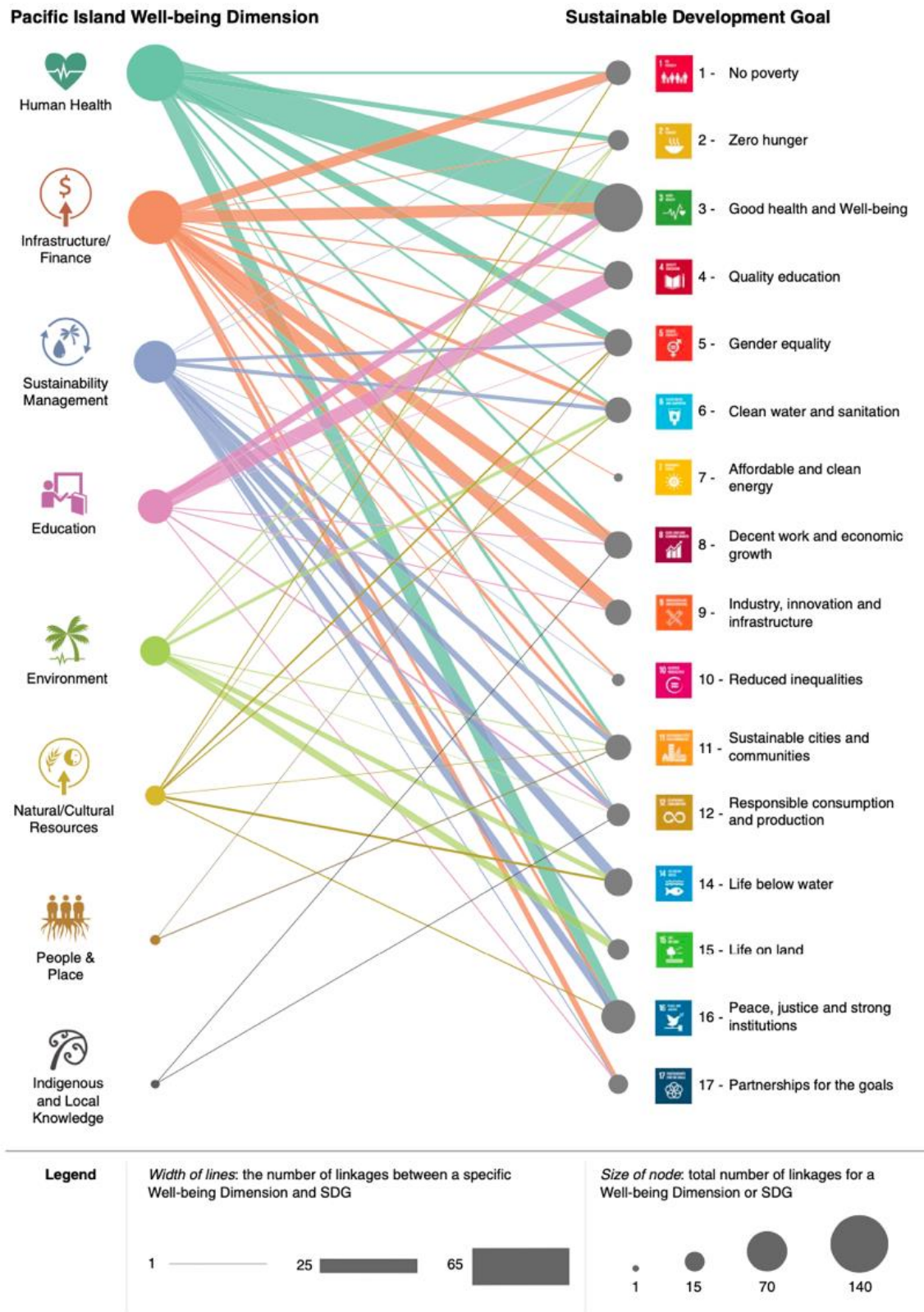
The ability to take advantage of the investment logic offered by the 'triple dividend' concept is ultimately dependant on foresight capacity. Scenario-analysis can be used to improve project proposal quality and support efforts to combine financing objectives strategically. Greater proficiency with foresight tools can help to inform the development of well-being indicators and help improve the effectiveness of investments in climate and disaster resilience. With improved ability to assess socio-economic, socio-cultural and non-economic determinates of well-being alongside risk-science and traditional economics, there is greater potential to exploit the 'triple dividend of resilience', develop

strategic financial strategies<sup>11</sup>, and improve project proposal concept quality. Improved risk foresight and fit for purpose institutional arrangements will ultimately improve capacity to identify more strategic investments.

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<sup>11</sup> Financial strategies should include the consideration of innovative fiscal buffers and social protection. Exploration of insurance mechanisms for individuals, communities, and critical infrastructure was seen to be particularly important for mitigating financial shocks and improving social safety nets for vulnerable outer island communities.

Figure 7: Recent analysis of the linkages between SDGs and 'Pacific Dimensions of Well-being' [20]



### 3) Institutional ownership and resourcing: *Who is responsible?*

**Key Finding: Efforts to implement the JNAP illustrated various practical and conceptual challenges involved with integrating responsibility and awareness of climate change issues into established government systems.**

The JNAP’s ability to make meaningful changes to RMI’s policy environment was significantly restricted by a lack of political ownership and an extremely limited implementation budget. These factors limited the required momentum to drive the plan at the political level as well as restricted practical implementation in a more general sense. Without the resources to socialise and embed the plan into cross-government planning processes, the potential to deliver decisively against the JNAP goals was inhibited from the outset.

The JNAP review consultation findings suggested that government agencies had encountered various bottlenecks when trying to implement projects that involved issues beyond their normal remit. Stakeholders suggested a need to further define and adjust the various coordination-based mandates of central planning agencies (e.g. Economic Policy, Planning and Statistics Office (EPPSO), Office of Environmental Policy and Planning Coordination (OEPPC), Environment Protection Agency (EPA), National Disaster Management Office (NDMO) and the OCS). RMI’s Agenda 2020 recognises these issues in its call to reform and review institutional arrangements. As much of the structure of the Government of RMI was a replication of the agencies and structures found in the United States Government, there was evidence to suggest that there were further segregations and divisions than was effective and useful for a remote atoll nation with a population of under 60,000.

Table 1 illustrates the overlap between ministerial/departmental mandates by showing the number of actors sharing oversight of different aspects of certain issue areas. Rather than demonstrating the way several actors are working together in relation to specific key issues, Table 2, instead, reflects issues that have been fragmented across different actors, reducing the potential for holistic and strategic oversight of key resources, risks, opportunities, and responsibilities.

*Table 1 Overlap of Responsibilities Across Government Ministries and Authorities*

	<b>Water Management</b>	<b>Development Planning</b>	<b>Disaster Preparedness, Response and Recovery</b>
1	EPA	OCS	OCS
2	Ministry of Finance	DIDA	DIDA
3	Ministry of Education / PSS	NTA	Ministry of Foreign Affairs
4	NDMO / OCS	OEPPC	Ministry of Internal Affairs
5	MEC	National Weather Service	Ministry of Natural Resources and Commerce
6	Ministry of Natural Resources and Commerce	EPA	Ministry of Public Works
7	MoCIA - Community Development Division	MAWC	Ministry of Transportation and Communications
8	Ministry of Works, Infrastructure and Utilities	MEC	MISC
9	Majuro Water and Sewer Company (MWSC)	Ministry of Finance	NDMO
10	National Weather Service	Ministry of Public Works	NGOs
11	OEPPC	Ministry of Transportation and Communication	NTA
12	Public Health Services	MISC	OEPPC



The challenges involved with managing water resources, for instance, was highlighted in RMI's Post Disaster Needs Assessment of the 2015-2016 Drought which stated that RMI's *'water sector is suffering from poor vertical coordination from actors at all levels, limited horizontal cooperation with other sectors such as education and health, and a lack of whole-of-system thinking'* [8]. The PDNA warned that this lack of coordination was likely to continue to result in *'inefficiencies, duplication, and conflicting efforts'* [8].

The JNAP review uncovered similar challenges concerning development planning and the conflicting mandates of the multiple agencies involved. The conflicts between the roles of different planning agencies were found to result in fractured decision-making and ongoing difficulties centralising and organising information, data and statistics. In a small government system with limited resources, there was agreement that it would be logical to better streamline and combine responsibilities in some cases to help increase collaboration and efficiency.

The Government of RMI, in keeping with Agenda 2020 objectives, has shown high-level recognition of these challenges which have simply been reinforced through the findings of the JNAP review. Agenda 2020 sets out objectives to guide the review of government mandates. Future efforts to deliver these objectives may combine some agencies and ministries in a way that strategically broadens portfolios while reducing a *'silo-ed'* and fragmented approach to key national issues.

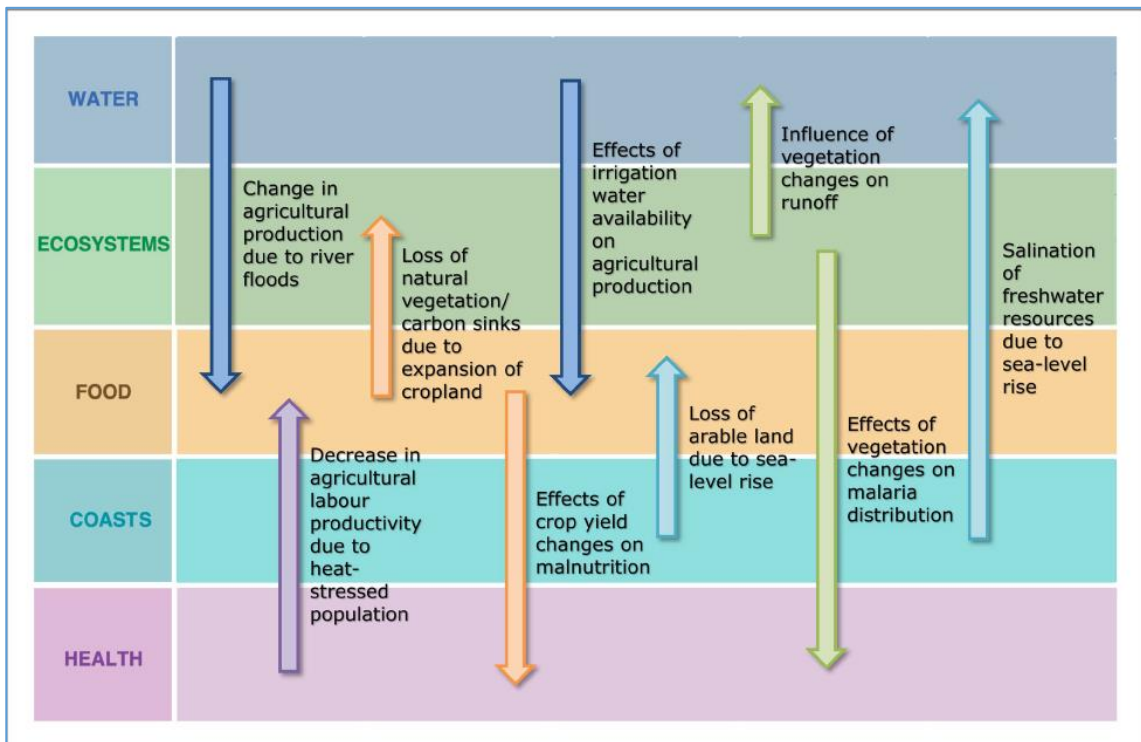
Overall, the cross-sectoral ambition of the JNAP was difficult to deliver in practice due to the highly compartmentalised way in which government planning processes, budgetary systems and responsibilities were organised. As a result, the JNAP review recommendations focused heavily on the strategic reforms required to better position government to be more dynamic and agile in its response and management of increasing structural risks.

RMI's experience with JNAP implementation ultimately brought attention to a more fundamental need to re-strategise government systems and functionality to better suit changing public service requirements. The barriers to inter/cross-government collaboration identified by the review were understood to be surmountable and also commonplace amongst small island developing state governments.

Most government administration structures are defined by the division of responsibility, however, these arrangements are often unable to adopt the holistic approaches needed to manage complex interrelated risks that transcend administrative boundaries [23].

Increasing uncertainty and rising challenges often require government institutions to adopt a more *'anticipatory'* posture as traditional sectoral divisions become less practical and relevant. This is especially the case in relation to climate change because climate impacts are not easily confined to traditional sectors and both the risk and opportunities involved with managing climate change requires a cross-sectoral approach to address the risks that often cascade between the traditional segregated areas of ministerial oversight (see Figure 8).

Figure 8: Example of how climate change impacts can 'cascade' across sectors [24]



### Recommendation: Strategically adapt institutional arrangements

**Strategically re-organising institutional arrangements and responsibilities is required to effectively address complex and interrelated risks.**

Successfully integrating climate and disaster risk considerations and priorities into government planning often requires more than the revision of policies, plans and budgets. In some cases, to mainstream and adapt decision-making to account for unprecedented risks, elevated uncertainty, and rapid change, the structures of government must also be adjusted to suit new priorities and operational dynamics. The International Risk Governance Centre highlights the need to transition/adapt governance systems to better suit the functions required to manage change and ultimately reduce the susceptibility of a regime or system to internal stresses and external shocks [25].

The re-organisation of ministerial portfolios and institutional arrangements can help to improve the way government capabilities are used. By considering the most strategic way to combine and divide portfolios there is greater opportunity to promote efficiency and effectiveness and improve capacity for evidence-based decision-making.

The revision of governance arrangements and the influence of scenario-analysis as a tool for strategy can together help increase the focus of decision-making on systemic issues, improve the evidence-base of decisions, create more flexible and adaptable decisions, and ultimately improve the effectiveness of decisions [23].

## How to implement?

The JNAP review brought into focus several options for further defining roles and responsibilities to help improve the coordination of RMI's national climate change response.

In relation to the many actors involved with various fragments of particular issues such as water, disaster risk reduction and development planning (see Table 2), the RMI Government could create leadership in these policy areas by appointing a lead agency to oversee specific key policy areas and sectors (i.e. water management). A lead agency to oversee the coordination between government and non-government actors would help to fulfil existing reform intentions by helping to create leadership, oversight and accountability.

Furthermore, the Government could reconsider the fundamental logic behind existing ministerial divisions and consider ways to combine teams, offices, portfolios and capabilities in a complementary way. The number of offices, departments and ministries that exist have a direct impact on the number of budgets in place and the degree of fragmentation of the intent, resources and oversight within Government machinery. RMI could therefore consider reforming and streamlining agency responsibilities and portfolios in the interests of both financial efficiency and strategic risk management.

## Responding to the Findings of RMI's JNAP Review

The review findings were further supported through the visit of the Micronesian Sub-Regional Representative to the Pacific Resilience Partnership, Mr Choi Yeeting (Climate Change Advisor, Kiribati Office of the President). This mission was funded by the PREP RCU-PMU and used as an opportunity to meet with the private sector, government, civil society, community representatives and academia to consult on the opportunities to progress key issues via the Pacific Resilience Partnership alongside discussions on the national findings of the JNAP review. By linking both national priorities and issues with wider regional messages this exercise helped to increase multi-stakeholder engagement and awareness of both climate risks and evolving management solutions.

The JNAP review helped to reorient RMI's PREP components around key findings and supported a common perspective on the general challenges and issues that require policy support. In response to the elements of the review that recommended reform of institutional mandates, the RCU developed a concept for a public service reform program to support the (now former) Chief Secretary in his efforts to lead change and improvement across Government. This concept and subsequent initiatives focus on strategic changes required to strengthen national capacity to improve the climate and disaster resilience of national sectors to climate and disaster-related impacts and events.

The JNAP review has since been used to inform regional level discussions, papers and briefings to support the Forum Economic Ministers Meeting. Key results have helped to shape the deliberations of PREP's Regional Advisory Committee (RAC) especially those concerning the challenges and key-enablers involved with advancing national capacity for evidence-based decision-making.

Following the publication of the JNAP review report in March 2018, the PREP RCU-PMU developed relevant briefings and a Cabinet paper to help further distil the report's findings into key messages. Shortly thereafter, RMI began the process of developing its '2050 Climate Strategy'. This strategy was endorsed in September 2018 and set out the intention for the RMI to develop a National Adaptation Plan (NAP) stating that the development of the NAP should incorporate *'the key recommendations arising from the review of the JNAP'* [26].

In keeping with the findings of the JNAP review around the need for greater specificity around projected climate and disaster risks, RMI's 2050 Climate Strategy clarified key knowledge gaps concerning climate risk. This statement is found under paragraph 149 of the 2050 Climate Strategy:

*In relation to tackling critical knowledge gaps, some immediate critical questions that need to be addressed include:*

- *How will global sea-level rise translate into regional and RMI-specific sea-level rise in the future?*
- *What changes in precipitation, air temperature, ocean acidification, tropical cyclones, and coastal vulnerability and hazards will RMI likely experience in the coming decades?*
- *What will be the economic, social, community and health impacts of the increasingly adverse effects of climate change, including on the most vulnerable?*
- *What resources, including sand and aggregate, are available – and what amounts are sustainable – for coastal protection and other adaptation and disaster risk reduction infrastructure projects?*
- *How will sea-level rise impact RMI's claim to its sovereign territory, exclusive economic zone, and the resources within its current boundaries? [26]*

Projections developed by scientists and researchers have offered a range of different risk forecasts for RMI. These differing perspectives and some degree of reticence to accept their implications have continued to restrict a deeper assessment of potential and probable future risk in the RMI. However, though the questions included in the 2050 Climate Strategy are not answered within the document, the presentation of these questions as 'critical knowledge gaps' is a step in the right direction, and one considered to be informed by the JNAP review process.

## Conclusion: Are we asking the right questions?

Across the Pacific, it is now increasingly important to shape policy around more specific and consistent expectations of future risk. The pre-emptive assessment of future risks and technical understanding of how different types of risks are likely to interact within a specific context requires policymakers to both ask and answer difficult questions. Efforts to improve foresight may help policymakers to ask the right questions and develop policies that are responsive and flexible in the face of uncertain and variable risks.

The findings of the 2018 JNAP review are increasingly consistent with a range of emerging policy recommendations. For example, aspects of the JNAP review findings are reinforced by elements of the Helsinki Principles set out by the Coalition of Finance Ministers for Climate Action (CFMCA). The CFMCA's recent launch of the Santiago Action Plan 2020 details a call for Finance ministries to map out long-term transition strategies (Helsinki Principle 1), review governance practices and organisational models (Helsinki Principle 2), and prepare national financial strategies to guide investment decisions (Helsinki Principle 5). These three principles somewhat mirror the findings of this case study. RMI has since become a signatory of the Helsinki Principles.

Delivering on the JNAP Review's recommendations and undertaking a system-wide approach to reform is a process that is best understood through the lens of "well-being". Managing complex and potentially catastrophic risk requires strong inter-government consensus on the operative factors that contribute to national well-being and greater efforts to understand how human well-being is likely to be impacted in future in light of future risks. Though it is not possible to predict the future, it is possible to use what is known and can logically be expected to improve the narrative that guides the decisions we make in the interest of protecting well-being. Through a proactive approach to improving foresight through scenario-building, a robust review of government mandates and responsibilities, and a long-term approach to investment, there will be greater potential to realise the central objectives of the JNAP and support the vision statement of RMI's National Strategic Plan 2015-2017:

***'In our own hands is our future'*** [27]

***---PREP Regional Coordination Unit-Project Management Unit, 2020***



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## Annex 1: A self-assessment tool: diagnostic questions for supporting national approaches to climate and disaster risk management

### **What are the main determining factors that will influence the future?**

*Map out and agree upon the key drivers of change, influences, and factors that will be likely to determine, define, and shape development objectives over mid to long-term time frames.*

For example, governments may start by considering:

- A) The nature, scale, and timeframe associated with current and projected climate change impacts
- B) The nature, scale, and frequency of disaster events
- C) The sources and rate of economic growth
- D) The nature of technological change
- E) Migration dynamics and the impact of anticipated trends and changes on social and cultural structures
- F) The degree to which governance arrangements are likely to adapt to suit changing service delivery requirements

### **What are the potential implications?**

*Use scenario-based exercises to structure and combine available evidence, expertise, and insights to help improve understanding of future risks and opportunities*

Draw on the expertise, views, and perspectives of technical stakeholders, communities, policymakers, the private sector and civil society to amass information and perspectives on future opportunities and risks. Develop multiple future scenarios through the consideration of different possible, probable, and potential changes and use these scenarios to identify strategic actions that will likely support preferable futures and produce no-regret outcomes.

### **How will we strategically address change?**

*Consider the structure and logic of existing governance arrangements in relation to current and anticipated risks.*

Strategically assess and reorganise/combine government and sector-based responsibilities to ensure capacity and oversight arrangements are suited to the management of the current risk context and likely nature of future priorities. The re-organisation of portfolios and institutional arrangements can in turn be an opportunity to integrate greater capacity for foresight and evidence-based decision making into government capabilities.

### **How will we ensure we invest effectively to support our priorities in light of growing risks?**

*Ensure investments protect well-being and seek to exploit the Triple Dividend of Resilience:*

To address complex interrelated risks, greater emphasis of and proficiency with the concept of the 'triple dividend' of resilience will help to inform the development of strategic financial strategies. The triple dividend of resilience is achieved when actions taken help to 1) avert or minimise risks, 2) protect economic activities and livelihoods, and 3) unlock new co-benefits and opportunities [28]. Foresight tools and scenario-building will again be important for ensuring government capacity to pre-empt investment priorities and improve the legitimacy and basis of project proposals and the quality of implementation design.

## Annex 2: Development-Pressure-State-Impact Response Approach Matrix

<b>Development-Pressure-State-Impact-Response Approach (DPSIR) Matrix</b>			
Drivers/ Pressures	State Changes	Impacts	Responses
Internal Migration	Increasing population in Ebeye and Majuro	Environmental degradation, increased demand for water, loss of buffer zones due to development, increased health risks, lack of jobs, pressure on public infrastructure.	Improve information required to plan for expected changes to populations on Ebeye and Majuro. Develop land settlement options and procedures to limit unsustainable pressure on the environment and the development of highly vulnerable settlements. Engage with landowners to communicate expected migration pressures and develop options to collaborate around solutions
Out-Migration	Reduction of the resident population	Cultural degradation, human capacity reduction, changes to traditional leadership dynamics. Reduced pressure on atolls and government services.	Improve information on migration and formalise systems for supporting and tracking migration and migration intent. Formalise an expected migration scenario and work towards specific strategic targets to enable planning the construes migration as a form of adaptation.
Sea-level Rise	Increased erosion rates, increased saltwater intrusion, increased risk of inundation, Increased risk of disaster events	Damage to infrastructure and environmental assets, reduced agricultural productivity, increased risk of inundation related disaster events, high economic costs,; impact of baselines to demarcate maritime zones potentially creating uncertainty/loss in maritime entitlements	Formalise sea-level rise scenarios and socialise expected risks with all stakeholders. Develop and finalise all relevant plans, procedures, and operational guidelines for disaster response operations. Invest in soft and hard infrastructure solutions. Prioritise non-regret and flexible adaptation methods. Invest in risk transfer instruments. Empower communities to perpetuate long term preparedness initiatives. Fully demarcate maritime boundaries so that SLR does not undermine maritime entitlements claimed under the Law of the Sea Convention
Drought	Reduction in available freshwater for agriculture and human consumption	Loss of food security, high economic costs and impacts on GDP, increased health risks linked to sanitation, disruption to education and livelihoods, increased vulnerability of the poor, decline in living standards and well-being, environmental degradation	Maximise water security through investment, management, coordination, and prioritisation at all levels. Continue to develop drought-resistant agricultural methods.
Extreme Rainfall Events	Flooding and Inundation, Increasing risk of Disaster Events	Damage to infrastructure, health hazards, increased incidence of water-borne disease, damage to soils and agriculture, environmental degradation	In addition to infrastructure improvements addressing coastal impacts, improve drainage and implement strategic methods for maximising benefit and minimising damage from heavy rainfall.
Increased Average Temperature	Increased heat stress on coral reefs, human settlements, and terrestrial ecosystems. Ocean Acidification, Coral Bleaching	Detriment to human health, changes to fishery dynamics, loss of livelihoods linked to agriculture and local fisheries, loss of natural reef barriers increasing vulnerability of the atoll environment, increased evaporation rates and reduced water storage, damage to hard infrastructure, increased energy costs and dependence on air-conditioning, increased national emissions	Continue to invest in preventative action through the Ministry of Health and community-based health clinics. Work with regional stakeholder to improve predictions around tuna fishery dynamics. Invest in natural coastal management solutions where possible to reduce further damage to vulnerable reefs. Engage support from research institutions to help improve marine ecosystem monitoring.
Financial Volatility	Uncertainty in Planning	Reduced strategic responses and preemptive actions to reduce risk. Increased risk of financial shocks. Increased economic and social vulnerability	Engage support to develop models and mechanisms that promote greater financial certainty and reduce dependency on volatile sources of international aid. Work with regional partners to develop new methods for stabilising international finance flows. Look to engage early with the potential benefits of carbon offset schemes linked to the international aviation and shipping industries.
Land-use change	Increased use of cement and hard infrastructure, loss of natural habitats and ecosystems	Loss of buffer zones and natural absorptive capacity leading to increased risk of flooding, increased vulnerability, increased risk of heat stress due to loss of natural barriers, loss of natural freshwater lens, damage to reefs and reduced potential to support traditional livelihoods, reduction in human benefits from ecosystem services	Improve regulation and planning through continued engagement with landowners. Reduce ad-hoc development in RMI's main population centres through new zoning regulations and the enforcement of building codes. Strengthen policy that protects important ecosystem services and ensure that development processes consider these services within the cost-benefit analysis.



## Annex 3: Coastal Protection and Scenario Building in the Marshall Islands

The main coastal protection methods applicable to atoll context are land reclamation, concrete seawalls, use of geotextile containers, and rock armour.<sup>12</sup> The estimated total costs of building and sustaining adequate coastal protection infrastructure for both Ebeye and Majuro atoll across this range of scenarios is estimated to range from \$13-42m per year in the 2020s to \$13-58m per year by the 2040s<sup>13</sup>. Migration is likely to become an increasingly recognised form of adaptation should the costs and risks increase into the higher end of this range.

It was estimated in 2006 that the total value of damage to coastal property on Majuro alone was likely to range from \$87.5m and \$373.2m<sup>14</sup> over a 25-year period.<sup>15</sup> The cumulative cost of building and maintaining seawalls and hard coastal protection structures over this same 25-year period (based on infrastructure lifespan) and scenario was estimated at \$236m.<sup>16</sup> Since 2006, sea-level rise projections have changed significantly, and these cost estimates are now likely to be underestimates. However, even if using this conservative scenario, it is clear that justifying investment becomes difficult due to the vast uncertainty and range in the projected damage estimates. Cost-benefit analysis must however also consider the accumulated benefits of coastal protection beyond the 25-year lifespan to understand whether the investment would reduce future costs.

The range of investment required under any version of the investment scenarios and timeframes could not be funded by the Government of RMI given the proportional relativity to RMI's GDP which is already reliant on external finance agreements. Between 2010-2014, US\$7.9m in additional grant finance was allocated to RMI for 'climate change-related; objectives.<sup>17</sup> Around US\$4m of this funding targeted adaptation-related objectives specifically. Though adaptation finance has increased since 2014 in RMI, it is clear that the cost of coastal protection investment needs alone would require a significant increase in international climate finance flows from developed countries.

Beyond these financial considerations, there are further constraints to building significant new infrastructure such as seawalls due to the lack of available sources of aggregate in RMI and the high cost of importing aggregate from abroad.<sup>18</sup> Options for sourcing aggregate in RMI involve reef blasting of fringing reef and sacrificial atolls for coralline limestone and offshore dredging for sand. These options involve complex environmental trade-offs. Scenario-building becomes particularly important as a tool for relating these scientific and economic considerations with social projections and trends. Coastal protection investment decisions will also be defined by where people are living, the size of localised populations, and the pace of out-migration. If social conditions, preferences, trends, and tipping points are not considered alongside environmental and economic factors then there is also risk that major investments decisions could be made based on expected population levels and socio-economic factors which made not exist by the time the true utility of the coastal protection investment is realised.

As is evident in the table below, many of the objectives set out by the previous *Disaster Risk Management National Action Plan* and *National Climate Change Strategy* were replicated within the JNAP. As a result, many aspects of these common and broad objectives did not evolve.

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<sup>12</sup> [35]

<sup>13</sup> [2]

<sup>14</sup> A 10% discount rate for the Pacific was applied during this study.

<sup>15</sup> [35]

<sup>16</sup> [35]

<sup>17</sup> [41]

<sup>18</sup> [35]

## Annex 4: JNAP Review Findings Continued

DRM NAP 2008-2018	NCCS 2014	JNAP Goals 2014-2018
<i>Establish an enabling environment for improved DRM in The Republic of the Marshall Islands</i>	<i>Strengthen the Enabling Environment for Climate Change Adaptation and Mitigation, including Sustainable Financing</i>	<i>Establish and support an enabling environment for improved coordination of disaster risk management /climate change adaptation in the Marshall Islands</i>
<i>Improve capacity for emergency preparedness and response at all levels</i>	<i>Disaster Preparedness, Response and Recovery</i>	<i>Enhanced emergency preparedness and response at all levels within the Marshall Islands</i>

There were also sub-objectives included in the JNAP under specific goals which had been moved from previous plans that had already remained outstanding for 6 years before being included in the JNAP. It was not clear how these objectives would be approached differently by the JNAP or in practical terms how these objectives would translate into achievable tasks.

DRM NAP (2008)	JNAP (2014-2018)
1.1.1 Review all relevant DRM policies and legislation (including the Disaster Assistance Act 1987) to assess, clarify and/or establish DRM organisational arrangements and responsibilities	1.1.1 Complete the review of all relevant policies and legislation (including the Disaster Assistance Act 1987) to assess, clarify and/or establish integrated DRM and climate change organisational arrangements and responsibilities which also include recognition and compliance with principles and practices of International Disaster Response Law (IDRL)
1.1.2 Implement DRM organisational arrangements as endorsed in the policy framework	1.1.2 Implement DRM and CCA organisational arrangements as endorsed in the Climate Change Policy framework
1.1.3 Draft new legislation or amendments to effect organisational changes	1.1.3 Draft new legislation or amendments to effect organisational changes

The JNAP results matrix format and content (example below) was also not presented in relation to a timeline or priority order which makes it difficult to understand the overall plan of approach or *theory of change*. Within the matrix, there are several proposed national-scale initiatives which are broad and less clearly linked to the budgeted activities, while others are specific and would require further background to implement. For example:

BROAD: *Develop mechanisms to enhance knowledge base of decision makers*  
SPECIFIC: *Establish a national policy for sourcing aggregate*

The review process also recognised a lack of priority order in the way the objectives and activities were presented. This suggested that more emphasis needed to be put on understanding the connectivity between the activities and how one objective might help progress another.

Table 1: Example excerpt from JNAP Results Matrix

OBJECTIVE	ACTIONS	RESULTS	LEAD AGENCY	INDICATOR
5.3 Address the issue of climate related health impacts, including socio-economic impacts	<p>5.3.1 Conduct assessment on the potential impact of climate change on health, including vector-borne diseases such as dengue fever</p> <p>5.3.2 Provide institutional strengthening of the health sector on the issue of climate change and other risks relating to health</p>	<p>Greater understanding of links between climate change and health</p> <p>Reduced number of vector-borne disease cases</p>	MoH	Number of cases of vector-borne diseases
5.4 Strengthen policy and technical capacity for Integrated Coastal Management (ICM) to improve environmental management and reduce vulnerability to climate change and natural hazards, including monitoring and enforcement of regulations	<p>5.4.1 Strengthen policy for integrated management of coastal systems</p> <p>5.4.2 Integrate DRM/CCA criteria in EIA regulations</p> <p>5.4.3 Develop, implement and support targeted on-the-job training on coastal ecosystem monitoring (e.g. CMI's coastal ecosystem monitoring summer program)</p> <p>5.4.4 Undertake a study of possible structural interventions and consider environmental/social impacts</p> <p>5.4.5 Upscale conservation and 'living shorelines' initiatives (e.g. Reimaanlok) including particular attention to vulnerable species and ecosystems</p> <p>5.4.6 Protect coral reef environments to enhance resilience against storm surge, sea level and other coastal hazards</p> <p>5.4.7 Provide training on regulations for managing coastal ecosystems, coastal natural and man-made hazards and on other regulations relevant for sustainable development of the coastal area for enforcement agencies</p> <p>5.4.8 Appoint dedicated environmental personnel in the Attorney General's Office</p> <p>5.4.9 Facilitate regular consultation meetings between landowners, private sector and regulatory agencies</p> <p>5.4.10 Improve garbage-dump and sewage facilities, including consideration of potential climate change-driven risks</p>	<p>Strengthened enabling policy in place for ICAM</p> <p>Management plans for improved coastal area management to reduce human impacts on the environment and to reduce disaster risk</p> <p>Skills exist for effective integrated coastal management and planning to reduce natural hazard risk</p> <p>Improved compliance with disaster risk reduction and environmental regulations</p>	<p>EPA EPA CMAC</p> <p>EPA CMAC</p> <p>MIMRA EPA</p> <p>CSO</p> <p>EPA MAWC</p>	<p>Timely approval of integrated policy for ICAM</p> <p>Number of ICAM plans approved in a year</p> <p>Established monitoring program is carried out during JNAP implementation</p> <p>Improved level of compliance as reported annually</p> <p>Number of coastal protection projects using sustainably sourced aggregate</p>







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