

Reducing the Risk of Disasters and Climate Variability in the Pacific Islands



REPUBLIC OF THE MARSHALL ISLANDS COUNTRY ASSESSMENT



THE WORLD BANK



Acronyms and Abbreviations

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
CCA	Climate change adaptation
COFA	Compact of Free Association
CSO	Chief Secretary Office
DRM	Disaster risk management
DRR	Disaster risk reduction
ENSO	El Niño Southern Oscillation
EPPSO	Environmental impact assessment
ENSO	El Niño Southern Oscillation
EU	European Union
FEMA	U. S. Federal Emergency Management Agency
GEF	Global Environment Facility
GIS	Geographic Information System
HFA	Hyogo Framework for Action
HYCOS	Hydrological Cycle Observing System
IA	Ministry of Internal Affairs
JICA	Japan International Cooperation Agency
MIMRA	Marshall Islands Marine Resources Authority
MWSC	Majuro Water and Sewer Company
NAP	National Action Plan
NAPIU	National Action Plan Implementation Unit
NDC	National Disaster Council
NEMCO	National Emergency Management & Coordination Office
NGO	Nongovernmental organization
NOAA	U.S. National Oceanic and Atmospheric Administration
OEPPC	Office of Environmental Planning and Policy Coordination
RMIEPA	Republic of Marshall Islands Environmental Protection Authority
SOPAC	Secretariat of the Pacific Islands Applied Geoscience Commission
UNFCCC	United Nations Framework Convention on Climate Change

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Introduction

The World Bank policy note “Not If, But When” shows the Pacific island countries to be among the world’s most vulnerable to natural disasters. Since 1950, natural disasters have directly affected more than 3.4 million people and led to more than 1,700 reported deaths in the region (excluding Papua New Guinea). In the 1990s alone, reported natural disasters cost the Pacific islands region US\$2.8 billion (in real 2004 value). The traditional approach of “wait and mitigate” is a far worse strategy than proactively managing risks. The Hyogo Framework for Action (HFA) 2005-2015 lists the following 5 key priority areas for action:

- (1) Ensure risk reduction is a national and local priority with a strong institutional basis for implementation;
- (2) Identify, assess, and monitor disaster risks and enhance early warning;
- (3) Use knowledge, innovation, and education to build a culture of safety and resilience at all levels;
- (4) Reduce underlying risk factors; and
- (5) Strengthen disaster preparedness for effective response at all levels.

This assessment report represents a stocktaking exercise to review the extent to which disaster risk reduction (DRR) and climate change adaptation (CCA) activities have progressed in the Republic of the Marshall Islands (RMI). It identifies gaps or impediments that hinder achieving the HFA principles and identifies opportunities for future DRR/CCA investment that would be timely, cost-effective, and implementable within a three-year timeframe. The focus is on risk reduction, rather than post-disaster recovery and response. While some sector-specific activities are addressed in the assessment of RMI national and local government policies and institutional arrangements, the RMI report does not provide a comprehensive summary of sector-by-sector activities. Instead, it

refers to efforts made by ADB, SOPAC and others in the sector and complements these with suggestions for taking some necessary additional steps.

The goal of the report is to deepen the understanding in the gaps, opportunities, and needs at the national level toward stronger operational disaster and climate risk management in the Pacific islands and to link closely to other ongoing and future efforts by other donors and stakeholders (such as SOPAC regional initiatives following the Madang Framework and the National Action Plans) to ensure synergy and avoid duplication. The assessment focuses on practical, proactive measures that the RMI can take to inform its national development policies and plans and to strengthen its capacity to reduce the adverse consequence of natural hazards and climate change, as it relates to risk reduction. The linkage of these two areas mainly includes managing the impacts of extreme weather events, variability in precipitation and other hazards such as storm surges and sea-level rise.

This assessment highlights aspects such as the current country status, gaps, opportunities, and barriers related to (a) national policies, strategies, plans, and activities to manage natural hazards; (b) the enabling environment for a comprehensive risk management approach to natural hazards; and (c) the capacity to undertake such a comprehensive approach, including institutional arrangements, human resources, public awareness, information, and national budget allocations. It also reviews and identifies the need for informed policy choices, improved decisionmaking processes, strengthened regulations, and legislative and policy changes required to support proposed country-level activities.

With respect to achievement of the first HFA principle, there is clear evidence of systemic difficulties among many Pacific island countries in establishing an enabling environment and promoting a cross-sector

focus for DRR and CCA activities. Since the available evidence shows that ad hoc and externally driven approaches have not provided satisfactory results so far, the HFA emphasis upon a strong government commitment and action is one of the primary and early challenges to be surmounted in achieving goals of the International Strategy for Disaster Reduction.

World Bank experience in countries with similar challenges shows that, while it is important to have a clear long-term vision, given the institutional, financial, and resource constraints, more modest “bottom up” approaches tend to have better results. Also, taking existing investment programs and incorporating simple key DRR/CCA elements demand relatively fewer efforts and resources and yield results that can lay the foundation for more complex, follow-up stages. Getting stakeholders to coordinate their activities in line with the 2005 Paris Declaration on Aid Effectiveness also appears to be relatively easier with such a modest starting point than with formal efforts aimed at overall “top down” coordination.

This RMI assessment begins by explaining the context of the country in relation to disaster risk reduc-

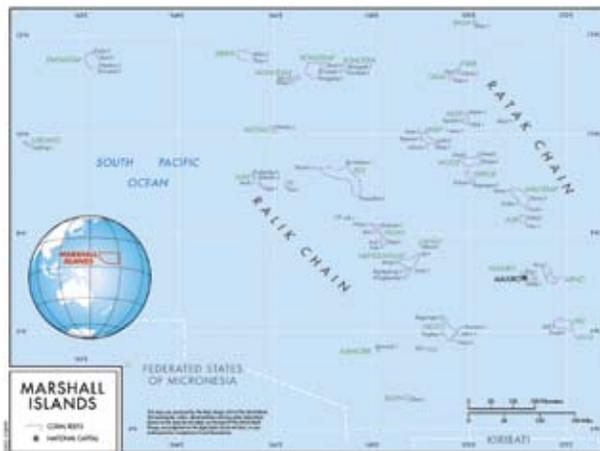
tion and climate change adaptation. It follows with sections on the Key Country Findings and Detailed Country Assessment that focus on some vital components relevant to HFA achievement: adopting and mainstreaming policies, data and knowledge, risk and vulnerability assessments, monitoring and evaluation, awareness raising and capacity building, planning and budgetary processes, and coordination. From this assessment, possible opportunities for addressing the identified gaps and needs within the HFA are presented in the final section. The proposals for future support are presented in a matrix in Annex A.

Funding for this assessment was provided by the Global Facility for Disaster Reduction and Recovery (GFDRR), which is a partnership with the UN International Strategy for Disaster Reduction (ISDR) system supporting the Hyogo Framework for Action. Other partners that support GFDRR work to improve livelihoods and protect lives include Australia, Canada, Denmark, European Commission, Finland, France, Germany, Italy, Japan, Luxembourg, Norway, Spain, Sweden, Switzerland, United Kingdom, USAID Office of Foreign Disaster Assistance, and the World Bank. ❖

Country Context

The Republic of the Marshall Islands, is located between 160° E to 173° E Longitude and 04° N to 15° N Latitude. It comprises two chains of 29 low-lying atolls and 5 islands (Figure 1). The country has a total land area of about 181 square kilometers and a much larger Exclusive Economic Zone of approximately 2 million square kilometers of ocean. Over two-thirds of its approximately 57,000 inhabitants live in the capital of Majuro Atoll and on Kwajalein Atoll. These two atolls are essentially urban in nature while the remainder of the atolls and islands—commonly referred to as the outer Pacific islands—are rural. Administrative district centers are located at Majuro, Kwajalein, Jaluit, and Wotje.

Figure 1. Map of the Republic of the Marshall Islands



The major natural and human-induced hazards facing the RMI are highlighted in Table 1. Additional challenges or hazards listed in other reports include sea-level rise, coastal erosion, pollution of the marine environment, ecosystem degradation, and food security.

Two aspects of these hazards are notable. First, the key natural hazards—tropical storms and typhoons, high surf and drought—are climate related and thus would probably lead to worse CCA and DRR issues affected by longer-term climate change. Second, the RMI faces physical, demographic and socio-economic

Table 1. Key Hazards of the RMI

Key natural hazards	Key human-induced hazards
Tropical storms and typhoons	Fire
High surf	Contamination of water supply
Drought	Outbreak of epidemic diseases
	Commercial transport accidents

Source: DRM National Action Plan

conditions that exacerbate vulnerability to these hazards, including the following:

- **Extremely high population densities.** This is caused mainly by internal migration and urbanization (e.g., in Ebeye and Majuro, the latter having a seven-fold increase over the last 50 years).
- **High levels of poverty.** An estimated 20 percent of the population lives on less than US\$1 per day. While there are many outer island subsistence communities, even within the urban centers of Majuro and Ebeye, there is also increasing incidence of poverty, with several communities living under conditions of extreme poverty.
- **Low elevation.** The RMI has an average elevation of two meters above sea level.
- **Wide dispersal.** The RMI is dispersed over a large area of ocean making administration, communications, and other operations very difficult.
- **Fragile island ecosystems.** Fragility includes the invaluable natural ecosystem protection provided by coral reefs and coastline vegetation and formations.
- **Limited and fragile fresh-water resources.** The available supply is highly vulnerable to over-use, contamination, and droughts.
- **A weak economic base.** The RMI has very limited economic resources and is vulnerable to global influences, with high dependency on two main donors, the United States and the Republic of China (Taiwan).

In recognition of these challenging conditions, the RMI drafted its *National Action Plan (NAP) for Disaster Risk Management (DRM)*, which requires Cabinet approval. The NAP was prepared in consultation with and participation of national and local governments, nongovernmental organizations (NGOs), and other stakeholders. It documents the current situation; evaluates gaps and barriers; and identifies required key goals, objectives, and needed actions. These are aligned with RMI development policies and plans.

The NAP preparation process sought to combine a bottom-up and top-down approach in line with the HFA consultative principles. There are other reports that cover similar ground, including *Republic of the Marshall Islands: Country Environmental Analysis* (ADB 2005), which seeks to mainstream environmental con-

siderations in the economic and development planning processes.

Instead of recreating a separate diagnosis and plan, this RMI report bases its assessment on the foundation and analysis of other recent documents. While there is a general coincidence of assessment, conclusions, and recommendations, this RMI report focuses more upon country adoption and institutionalization of policies and implementation of action plans to address disaster risk reduction and climate change adaptation within a unified development framework. One main goal is to identify short-term (e.g., 3 years or less, in first instance) and longer-term needs that can fill critical gaps in line with the HFA guidelines. The identified goals and outcomes of NAP are presented in Table 2. ❖

Table 2. NAP Goals and Outcomes for RMI

Goals	Outcomes
Goal 1. Establish an enabling environment for improved DRM in RMI.	Well-functioning institutions and systems for DRM.
Goal 2. Mainstream DRM in planning, decision making and, budgetary processes at national and local level.	DRM is mainstreamed in all relevant processes at all levels, and in all relevant sectors.
Goal 3. Improve capacity for emergency preparedness and response at all levels.	Organizations and agencies at all levels are well prepared and resourced to respond to disasters.
Goal 4. Build strong and resilient disaster management early warning and emergency communication systems.	Effective early warning and communication among Majuro, Ebeye, and the outer Pacific Islands at all times.
Goal 5. Access to safe and adequate clean water at all times.	Reduced vulnerability to water-related hazards and water shortages resulting from hazards.
Goal 6. Sustainable development of the coastal area.	Reduced vulnerability to coastal hazards.
Goal 7. Reduce economic dependency of the Outer-Islands.	Improved outer island resilience to hazards.
Goal 8. Improve understanding of the linkages between zoning, building codes, and vulnerability to disasters.	Decisionmakers and public more receptive to the need for adequate zoning and building codes in reducing vulnerability.
Goal 9. Raise the awareness of DRM amongst the public.	Public is better informed of national and outer island DRM issues.
Goal 10. The NAP implementation and impact is monitored and reviewed on a regular basis.	The NAP is effectively implemented and kept up to date.

Key Country Findings

Overall, this report concludes that three features of the hazard situation in RMI raise major concerns about the urgency for reducing risks in the country:

- (a) *Vulnerability to natural and human-induced hazards, inherently high in the RMI due to its fragile island environment, appears to be increasing.* This is a consequence of modernization, urbanization, and unsustainable development processes that have not taken current and future risks into account.
- (b) *The potential for catastrophe in RMI is very large and growing.* While the list of hazards is relatively small, the potential for catastrophic damage and loss of life from several hazards is very high. Disease, epidemic,¹ and fire are potential hazards, but typhoons top the list. In terms of RMI as a whole, the greatest impact would be from direct typhoon hits on Majuro and Ebeye. While its location on the relatively low-risk edge of historical typhoon tracks mitigates this somewhat, the RMI is not immune from strong typhoons like ones suffered in 1905 and 1918. The last major typhoon in 1991 significantly affected 6,000 people. If there was even a level-2 or -3 event today, the impact on life and property could be significant for many reasons. Two urban areas account for 66-70 percent of the population. The land has low elevation (less than two meters) and is narrow. Housing and most buildings are generally of poor construction, not well maintained and tightly packed. There are no established agreed means of evacuation or identified shelters to seek refuge. The airport would be unusable. Climate change is likely to increase the intensity, frequency, path, and other characteristics of typhoons.
- (c) *Current efforts to deal with underlying risk issues appear to be under-resourced and not well organized or managed.* Despite having been identified

as long-standing priority issues, solid waste disposal, inadequate sanitation, and issues related to water quality and quantity remain largely unmitigated problems. These severe problems have negative consequences for human health, settlements, and sustainable development in both urban and rural atolls. The RMI capacity to manage the patterns of population growth, land use, and environmental impacts in order to reduce the risks is subject to some severe constraints:

- *Inadequate waste management systems.* Given the limited land space available in Majuro and Ebeye, solid waste management has been a growing problem with the potential for pollution of critical water sources and the general threat to public health.
- *Poor sanitation.* While much of Majuro and Ebeye have reticulated sewerage, treatment of raw sewerage before disposal at sea is inadequate. Elsewhere, overflowing septic tanks or lack of toilets increase the threat of contamination of groundwater. Water-quality testing revealed high levels of contamination of wells and of coastal waters, in both the urbanized areas as well as the outer Pacific islands, with consequent outbreaks of gastroenteritis, cholera, and other health impacts.
- *Coral reef and beach degradation.* Mining of beaches for building aggregate increases vulnerability of adjacent areas; and with less natural reef protection, the islands are more vulnerable to storm surges and coastal erosion.
- *Unregulated coastal development.* Environmental Impact Assessment regulations and newly revised Coastal Management Regulations provide the conditions necessary for improving development to reduce risks. However, imple-

¹ In 2000 a cholera epidemic affected 218 and killed 6.

mentation and enforcement of their provisions face considerable challenges. More needs to be done to address the perception of several stakeholders who are not apparently convinced of the benefits of such regulations (through their economic, social, and related welfare).

- **Poor settlement planning and lack of building codes.** These are exacerbated by the existing land-tenure system, overcrowding, poverty, and resource and other constraints on monitoring and enforcement measures, all of which contribute to high-density, structurally deficient buildings and health and fire hazards, especially in areas of rapid urbanization.
- **Isolation, lack of emergency infrastructure and high dependency, especially in the outer Pacific islands.** The outer islands are particularly subject to typhoons and droughts, with resultant water and food shortages. Their recent increased integration into the monetary economy, and the consequent reliance on remittances and purchased food, has increased their vulnerability to such shortages.
- **Recent positive steps.** Having noted the above areas of concern, it is also important to record some of the past and recent positive initiatives of the RMI in such areas as improved governance structures and promotion of an enabling environment in support of disaster risk reduction and climate change adaptation. Key features of this progress include the following:
 - **Overarching development strategy (Vision 2018).** This strategy explicitly recognizes hazard risks and climate change as priority issues to be addressed.
 - **Legislation.** Several laws — the National Environmental Protection Act 1984, the Planning and Zoning Act 1987, the Coast Conservation Act 1988 — all provide a very good framework

requiring specific measures to be undertaken to prevent further environmental degradation and to reduce vulnerability.

- **Office of Environmental Planning and Policy Coordination (OEPPC).** The OEPPC was established in 2003 to specifically address compliance with various international conventions and activities including those involving climate change.
- **National Action Plan for DRM.** Upon its completion, the National Action Plan has a direct link to the RMI development policy and strategy and includes actions for enhancing the enabling environment as well as actual on-the-ground risk reduction.
- **NAP Implementation Unit.** When created, this unit will be housed under the National Emergency Management Coordination Office (NEMCO) within the Office of the President. This is expected to elevate DISASTER RISK REDUCTION as an important multi-sector function at both national and local levels.

So that the above strategies, legislation, and institutions become operational tools toward achieving DRR and CCA objectives throughout the country, one main challenge will be ensuring adequate human and financial resources, authority, accountability, and other related elements. Current indications recognize several impediments in the system. Actions at several levels are urgently needed if the HFA objectives are to be achieved as envisaged.

The reasons for the current situation are complex: resource gaps; institutional, structural, functional, and perceptual rigidities; and national and local government disconnect. These are further complicated by several cultural and traditional practices involving leadership, land ownership, power, and inter-group dynamics. Some of the recent consultation initiatives

have assisted in preparation of action plans, which generally reflect population concerns and priorities. However, continued engagement among all levels of stakeholders for implementing, monitoring, and supervising proposed changes is not occurring. This may be where more effort is needed to ascertain the problems and how to address them.

Within this context, the report has identified the following 6 priority areas where appropriate interventions, consistent with the NAP goals, could prove especially effective in removing obstacles and promoting DRR and CCA objectives:

- Strengthening the capacity of the National Emergency Management and Coordination Office,
- Developing an information management system,
- Enhancing community-based awareness and education to change attitudes and behavior toward effective risk reduction,

- Climate-proofing new water supply developments,
- Reviewing and revising draft building codes,
- Testing early warning response.

These 6 opportunities for investment are selective, not comprehensive. They are based on a combination of priorities identified by the NAP; through consultations with the RMI government, local government, and private sector; and in other reports.² The selection was further narrowed, based on 4 criteria: (a) key bottleneck points requiring relatively small investments to address simple obstacles but yielding disproportionate benefits within a short time; (b) direct help in addressing critical DRR and CCA issues; (c) sustainable, longer-term benefits; and (d) identified in-country commitment, champion, and/or effective arrangement for implementation. A summary of the country situation and the gaps or impediments that lead to effective risk reduction, which justify the selection of these opportunities, is presented in Table 3. ❖

² For example, *Republic of Marshall Islands: Country Environmental Analysis* (ADB 2005).

Table 3. Summary of Key Gaps and Opportunities for DRR and CCA for RMI

Situation	Gap or Impediment	Opportunities
A NAP was approved, with coordinating Lead Agency being the National Disaster Council and its operating arm, the NEMCO.	The NEMCO has limited resources, capacity and overall commitment to implement NAP.	Strengthen the capacity of NEMCO, by ascertaining basic reasons for its current performance, identifying key actions needed and assisting counterpart in preparing an adequate response (including needed resources) to achieve goals.
DRR and CCA require cross-sectoral cooperation and sharing of information and basic data to assist it in its task.	No central system for information management, storage, access, maintenance, retrieval, interpretation, etc.	Assist RMI in identifying an appropriate basic “low-tech” starter system to facilitate a simple management information system with the goal of having all sector actors utilizing the same database for all phases (conceptualization, planning, implementing, benchmarking, monitoring and follow up).
Success of NAP and other risk reduction programs require community and local government engagement and participation.	A large gap exists between national and community levels regarding awareness, attitudes, and behavior toward DRR and CCA.	Community-based awareness, including education and efforts to change attitudes and behavior regarding engagement in DRR and CCA and in building and maintaining the resilience of environmental, social, and economic systems to reduce vulnerability.
Droughts are a major hazard in RMI and a major threat to water supply.	Current plans and projects to expand and improve water supply systems are not taking into account past lessons learned or expected higher risk due to future climate change.	Climate proofing of water supply systems, involving assessing the increased risks from a changing climate and the design changes that should be taken into account to achieve acceptable levels of risk for sustainable development.
Development in RMI, particularly in the private sector, is generally of poor construction and is vulnerable to disasters.	The country has no building codes and each donor or entity uses its own codes. This makes it difficult to monitor and ensure compliance with various safety and other requirements.	Review current practices, specific country needs, and preparing draft building codes, including rolling out the codes to public, commercial, and then residential sectors, and tightening linkages to financial lending and other institutions.
Early warnings exist for some hazards like droughts and typhoons.	Warning dissemination and response is not well developed or tested.	Early warning response (4.3 of NAP), including filling the gaps in warnings, and reviewing and improving dissemination and public perception and response measures.

Detailed Country Assessment

Identification, assessment, and monitoring risks

The Hyogo Framework for Action highlights identification, assessment, and monitoring of disaster risks and enhancing early warning systems as key priority areas. With regard to these aspects in the RMI, there are some activities where the country has made good progress and others where it lags. For example, in climate change statistics, the RMI has a very good database and a well-organized system and process in place. This achievement is thanks to the Meteorological Service Unit, which is owned and supported by the U.S. National Oceanic and Atmospheric Administration's (NOAA) National Weather Service and operated by RMI nationals contracted by NOAA. Within the RMI, there is one station with an approximately 50-year record, and 6-7 automatic stations strategically spaced throughout the country (with records ranging from 10-20 years). There are 2 tidal gauges—the older established gauge provided by the University of Hawaii and the more recent Sea-Frame gauge supported by Australia. The 2 gauges record sea-level data that are readily accessible.

The record of temperature, precipitation, wind, and pressure data are archived and available for time periods and in formats that facilitate a range of risk and climate change reviews and assessments. These data are housed at the U.S. National Climate Data Center and can be readily accessed (but at a cost, even for in-country studies). Tools are also available to analyze and provide the data at the request of RMI government agencies, contractors, and consultants working on RMI projects.

While some attempts are being made to analyze the data and provide information to the relevant user groups,³ there is still a significant level of under-utilization of the available data, both in terms of DRR/

CCA activities as well as in several other areas. For example, with its high dependency on revenue from fishing licenses/catches and close correlation between water temperature and catch, more could be done in estimating these and assist the RMI to better manage its migrant tuna stocks and income from fisheries.

Knowledge, data, and tools pertaining to other biophysical, social, and technological elements of risk are not as advanced as with climate change data. For example, the RMI Environmental Protection Agency has limited databases on solid waste, coastal management, or water quality, and limited access to geographic information systems (GIS) for spatial, land use, and similar analyses. This is a major constraint to disaster risk assessment, reduction, benchmarking, monitoring, and enforcement. The GIS is often considered a useful tool. Its effectiveness however depends upon the skills of the people using it; the assessments done; and information provided to relevant users, policymakers, and other stakeholders. Other uses of mapping tools to show coastal areas, water quantity and quality changes, and public assets appear to be limited at this time. The severe skills shortage in the region could be one reason why the potential for improved data management, analyses, and related tasks is not being fully achieved. This should be an important factor in efforts aimed at finding more appropriate technology solutions to ensure appropriate operation and maintenance and long-term sustainability.

Overall, while there is a relatively solid base of knowledge, data, and tools for some sectors in the RMI, particularly in terms of climate data, there are some important gaps affecting mapping, monitoring, and related activities. The NAP provides a framework for RMI to implement risk-reducing activities and, in terms of risk assessment, focuses on key needs in the water sector and coastal areas. It is essential that

³ For example, the three-month climate and rainfall forecasts by the Meteorological Service Unit (Pacific ENSO Applications Climate Center) have been used by water resource managers to mitigate drought impacts.

risk-reduction activities in these areas are grounded on sufficient data and a sound understanding of the dynamics of the process.

Gaps

Some of the key gaps are summarized below:

- **Low level of assessment and development of tools to aid resource managers and decision makers.** Efforts are needed to help in identifying ways of using the available data more appropriately in key DRR, CCA, and socio-economic activities. A system should be put in place to facilitate areas where reliable data are not available. Care should be taken in ensuring that recommended actions are compatible with country skills, capacity, and resource base; and sustainability factors should be a key consideration in deciding upon recommended technologies.
- **Inadequate data management tools.** At best, most of the existing collection, storage, and analytical tools appear to be rather basic. For example, in the RMI Environmental Protection Authority (RMIEPA), data are still largely stored in hard-copy form. For most cases, the system would benefit from more reliable storage, monitoring, security, access, and fire-safety facilities. If information (reports) and data system are designed to rely more upon established processes and

guidelines, it could become more immune from the disruptive impact of frequent staff turnover.

- **Absence of a system for information sharing and exchange.** Climate data is stored with the Meteorological Service Unit, terrestrial data (including water quality) with the RMIEPA, and marine data with Marshall Islands Marine Resources Authority (MIMRA). There is need for a stronger, more effective national information system, a digital strategy or a mechanism for information sharing and exchange. The NAP implementation could help to address some of these constraints.

Vulnerability and risk assessment

Current situation. Twenty-two of the 29 low-lying atolls and 4 of the 5 coral islands are populated. They are all extremely vulnerable to climate-related hazards such as typhoons, storm surges, and droughts. Additional risks from fire, epidemics, water contamination, and increased salinity, especially in the urban areas, complicate the task of undertaking comprehensive risk assessments and also tend to combine and accelerate their negative impacts. Table 4 below summarizes the primary threats facing various sectors in the RMI while the rest of this section focuses upon some manifestations of system failure and needs.

Table 4. Threats to the RMI

System	Threat				
	Storm surges	Tropical storm	Rain storm	Drought	Epidemic
Housing	H	H			
Transportation	H	H			
Communications		L			
Power	H				
Health				H	H
Water	M	M		H	H
Agriculture		M	H	H	
Fishing					
Tourism	M	M			M

Source: United States Army Civil Affairs, 2003 (as reported in ADB 2005).

Ecosystem degradation. The physical integrity of the islands is dependent on the natural supply of coral-line material from healthy reefs and uninterrupted coastal processes that ensure replenishment of material along the coasts. Human activities that have an adverse impact on the natural equilibrium have made the coasts more vulnerable to erosion and seawater intrusion. The threats stem from the degradation of the marine ecosystems, unsustainable use of groundwater, the blocking of sediment supply paths, unsustainable coastal sand mining, and building of inappropriately designed coastal protection structures (e.g., seawalls).

The marine ecosystem and particularly the reefs suffer by such physical change as well as pollution and increased solid waste dumping. On Majuro, raw sewage is discharged over the reef edge at an estimated depth of 20-30 meters. However, a break in the outfall pipe at the reef edge has resulted in raw sewage being swept along the coast.

The indiscriminate mining of reef and lagoon flats and beaches have had a major impact on sand replenishment and exacerbated coastal erosion. Unless alternative sources for aggregate are provided, this destructive practice will continue to further threaten the very stability of the atolls, particularly Majuro. Studies carried out in 1997 by the Secretariat of the Pacific Islands Applied Geoscience Commission (SOPAC) indicate that, while there is an awareness of the problem, an appropriate response is still not in place, either because of competing priorities or inadequate access to these prior studies.⁴

Poor solid waste management, including ineffective sanitation and sewage disposal, threatens coastal resilience, water quality and community health. There have been significant cholera outbreaks in the RMI, and gastroenteritis is a continuing threat to a large

portion of the population on Majuro and Ebeye.

Disaster preparedness for effective response

Current situation. At the national level, disaster risk management responsibilities lie with the National Disaster Council (NDC) and NEMCO. Even though efforts are being made to change the focus from post-disaster response to primarily disaster risk reduction and climate change adaptation, it will take some time and effort to accomplish this. In the past, as a matter of course, other sector agencies did not explicitly take disaster risk management into consideration in whatever policies and plans they had. Significant changes are expected to result if Cabinet endorsement of the NAP is accompanied with enough commitment and resources to commence its implementation under an NAP Unit based in the Office of the Chief Secretary and led by the Deputy Chief Secretary.

One major goal of the NAP is to mainstream DRM into the planning, decisionmaking, and budgetary processes across a broader sectoral arena at both national and local levels. This is because DRR requires an integrated and cross-sectoral approach, one in which disaster risk considerations form an integral component in all development-related planning. Importantly, this includes integration of DRM considerations in budgetary allocations. The key sectors for disaster risk management in RMI, as identified in the NAP situation analysis, include:

- Planning
- Finance
- Local Government
- Environment
- Fisheries
- Health
- Agriculture

⁴ SOPAC Report by Chunting Xue, September 1997.

- Tourism
- Utilities (power, water, transport)
- Private sector
- Civil society organizations

The policy framework for the NAP is the RMI *Vision 2018: The Strategic Development Plan Framework 2003–2018*, which explicitly includes disaster risk reduction and climate change adaptation and foreshadows the synergies between them. Goal 10 (Environmental Sustainability), Objective 2 states the following:

...to develop and have in place a contingency/adaptation plan to counter the emerging threats resulting from the adverse effects of climate change including a National Disaster Plan.

While this represents one major step in mainstreaming at a high national level, there remain considerable gaps to fill, especially in translating this policy goal into the plans, strategies, and regulations at sector and agency levels. As in many other countries, those trying to make this transition in the RMI are finding it to be a challenging task in several respects (knowing what to do, obtaining human and financial resources, convincing key players to become more active participants, logistical support, etc.). In RMI there is very little left from the Compact budget, and there are major challenges to releasing funds from the Republic of China (Taiwan) for risk reduction.

Institutions, instruments, and incentives could provide the focus for facilitating strategic assistance. Most sector agencies do not prepare strategies and plans into which risk reduction activities can be readily mainstreamed. The challenge will be to get these entities to develop and use simple strategies and plans that transform DRR and CCA national policy statements into operational instruments as part of normal sector agency activities,

Establishing and operationalizing the NAP could provide the ideal entry point for mainstreaming DRR and CAA principles in operations. Among other things, this involves identifying champions within the ministries and lower-level agencies and ensuring adequate resource capacity for the task at hand. After ensuring that the entities are adequately resourced, they must be held accountable for their agreed commitments. Currently, only a few government agencies are trying to develop strategic plans with performance-based budgeting and associated accountability elements. For example, the RMIEPA is responsible for water quality, coastal management, and solid waste monitoring, areas which are directly related to key hazards of drought, typhoon, storm surges, outbreak of epidemic diseases, and contamination of water supply and their potential impacts. The RMIEPA has responsibility for the whole country, but its budget, staff, equipment, and other resources are clearly inadequate for these responsibilities. The REMIEPA has a US\$400,000 annual budget, three staff on Majuro and one on Ebeye for water quality monitoring, three staff for coastal management, and two staff for solid waste monitoring. Additionally, its current activities are more geared to monitoring of water quality and solid waste for operational and compliance purposes. As a consequence, it does not necessarily prepare or maintain any systematic time-series databases that can provide the information required for evaluation of overall risk reduction efforts in the long term (as relates to NAP Goal 10). On the other hand, for some sectors, such as health, various indicators of public health are routinely measured and can be used for monitoring and evaluation. For some hazards, such as coastal erosion, there is no systematic comprehensive monitoring in place. Overall, the need for integrating monitoring and evaluation activities into a more comprehensive approach is recognized in the NAP. There appears to be excellent low-cost opportunities to accomplish several initial steps with relatively small resource outlays. For example, given the size of the RMI and the overlaps among subsectors, there appears to be many opportunities for joint field visits, common databases, pooled assessments, and more.

A necessary condition for successfully mainstreaming any DRR and CCA plans is to have participants identify where they are and agree where they want to go, what they need to get there, and how they will know what progress they are making. In this context, monitoring and evaluation of performance requires that strategic planning and performance indicators are uniformly adopted throughout government agencies, using simple tools for initial benchmarking and measuring progress (further discussed in “Planning and budgetary processes” section below).

Possible areas of initial assistance for the NAP might include the following:

- Supporting key systematic data and information gathering related to the specific operations of relevant government and sector agencies; and
- Establishing simple benchmarks based upon such information, formulating simple strategic plans consistent with the capacity and resource constraints of the respective entities, and having an established monitoring and evaluation system.

Awareness and capacity building. The NAP Task Force and other assessment reports (e.g., ADB, 2005) highlight awareness raising as a key component to ensure that the goals of NAP are achieved. Even with extensive publicity and coverage of government commitment to the DRR and CCA principles, it appears that among most groups (elected officials, line agencies, mayors, private sector, communities, etc.) awareness of NAP and the opportunities and benefits of risk reduction are not taken seriously. This seems to be especially so among local government, communities, and civil society. Yet it is perhaps at this level where, in the longer term, changes in awareness and attitude can really make a difference. Only by building a both a strong top-down as well as bottom-up foundation and ownership can the benefits of disaster risk reduction and climate change adaptation be achieved in an effective and sustainable manner.

In large part, this will require not only raised awareness in the narrow sense of the term, but also a greater effort on the part of national government to build a more participatory approach to the implementation of the NAP and other related risk-reduction activities. An excellent start was made during the development of the NAP. There is now the need to continue and strengthen the participatory process during the implementation phase.

In concert with awareness raising, there will continue to be a need to upgrade knowledge and skills for risk reduction. At the national government level and from one sector to another, the pervasive constraint to effective risk reduction is the lack of capacity. This need will grow as NAP and other risk reduction programs move forward, unless concerted action is taken to build capacity. This need applies as well to the local government, communities, the private sector, and civil society

Gaps

- *Large differences between national and local levels with regard to awareness of, and the need for, disaster risk reduction and climate change adaptation in the NAP process.* There needs to be a mechanism to bridge this gap, with a combination of awareness raising, education, and participatory engagement of local government and civil society in the process. This is a role that a strengthened NEMCO could assume.
- *Disasters risk reduction and climate change adaptation not included in education.* The Ministry of Education will need to assess how best it can incorporate appropriate curricula at all levels so that students will have the required knowledge.
- *Lack of strategy for effective capacity building to sustain risk reduction.* A large gap in the whole process is the non-participation of the government arm responsible for human resources. If disaster risk reduction and climate change adaptation are

to move beyond short-term goals and technical assistance, a strategy for capacity building and sustainable human resource needs to be put in place within government institutions.

Governance and decisionmaking

Current situation. The RMI Government has a bicameral legislature with an upper and lower house. Elections are held every 4 years with each of the 24 constituencies electing a senator to the lower house, the *Nitijela*. The upper house, the *Council of Iroij*, is an advisory body comprising 12 tribal chiefs. The Council of Iroij is consulted on all customary and land issues. The Nitijela elects the President, who is head of state as well as head of government. The executive branch consists of the Presidential Cabinet, 10 ministers appointed by the President with the approval of the Nitijela. The public service is headed by a Chief Secretary, appointed by the President, who is responsible to the Cabinet for the general direction of the work of all departments and offices of government.

Formalized disaster risk management first entered the political arena of the RMI in 1987 with the passing of a National Disaster Management Plan. It became firmly entrenched 7 years later with the enactment of the Disaster Assistance Act, which provided for the establishment of a National Disaster Management Committee and a National Disaster Management Office located in the Office of Chief Secretary. The year 1994 also saw the passing of a Hazard Mitigation Plan, a National Disaster Manual, and an Airport Disaster Plan. A Drought Disaster Plan was passed in 1996, followed by the drafting of a revised National Disaster Management Plan in 1997. The most recent legislative activity on the DRM front was the development of a Standard Hazard Mitigation Plan in 2005.

Existing DRM arrangements have to date been heavily focused on the conventional approach to disaster

risk management (i.e., preparedness, response, and recovery) with less attention being focused on the equally critical component of reduction. The NAP seeks not only to review existing DRM legislative and institutional arrangements but also to ensure a better balance between disaster management (response) and disaster risk reduction in RMI.

The Ministry of Internal Affairs is the administrative coordinator for local governments. Each inhabited island has a local council headed by a mayor. Local council activities include local police services, solid waste collection, and maintenance of local roads. Mayors report back to the Ministry of Internal Affairs every three months for administration purposes. District centers have their own locally appointed officials and police force. Funding for the district centers comes in the form of grants from the national government and revenues raised locally.

The judicial power of the Marshall Islands is independent of the legislative and executive powers and is vested in a Supreme Court, a High Court, a Traditional Rights Court, and District and Community Courts.

The most important RMI civil society organizations are local community organizations, including parents-teachers associations, sports clubs, women's clubs, and the very active churches (many of which also provide important school services). The RMI has a small number of NGOs, all based in Majuro, that provide an assortment of services from education to vocational training, to advocacy on women's issues. The NGO sector in RMI is however not particularly vibrant and plays a limited advocacy role. This is, in part, the result of dependence on government funding, as well as the pervasiveness of non-confrontational cultural norms.

In terms of national development policy and priorities, the Government charted the *Vision 2018: The*

Strategic Development Plan Framework 2003–2018 which establishes the overall framework of priorities for the RMI and sets the first segment of the Government's Strategic Development Plan for the next 15 years. It incorporates the broad national vision of where the people would like to be by 2018 in terms of sustainable development. It includes the long-term goals, objectives, and strategies developed through an extensive consultative process starting with the Second National Economic and Social Summit and then followed by extended deliberations by various working committees established by the Cabinet.

The second and third segments of the Strategic Development Plan will consist of master plans, which are mandated under the Vision 2018 and focused on major policy areas, and the action plans of ministries and statutory agencies. The NAP is an example of an inter-sectoral action plan. These master plans will show programs and projects together with the appropriate costing. It is also the intention for all atoll local governments to develop action plans tailored toward the achievement of the national vision.

The national goals for the RMI can be summarized as follows:

- Increased self-reliance,
- Renewed economic growth,
- Equitable distribution,
- Improved public health,
- Improved educational outcomes,
- International competitiveness, and
- Environmental sustainability.

Priority sectors for the RMI government are education, health, environment, and infrastructure development and maintenance. The NAP aligns itself both with the regional policy framework (i.e., the *Pacific Regional Framework for Action on Disaster Risk Reduction & Disaster Management*) and the national policy framework (i.e., Vision 2018 and its master and ac-

tion plans). Although Vision 2018 was drafted before the recent attention to disaster risk reduction, it is felt within RMI government that its goals remain broad and flexible enough to accommodate the DRR emphasis without amendment.

Impediments. For the most part, while the enabling governance structures, policies, and legislation are necessary to avoid increases in risk exist, there are critical gaps, particularly in regulation and enforcement:

■ ***Absence of land-use planning, zoning, and siting.***

At the national level, the enabling provisions may be in place, but implementation falls short at the local level. For example, in order to avoid further coastal degradation and reduce risks, the Coastal Conservation Act 1988 and the National Environmental Protection Act 1984 provide the enabling provisions, but local governments that are responsible for enacting ordinances for land-use zoning requirements have not done so. As a stop-gap, the regulations for environmental impact assessment in RMI have been used on selected case-by-case bases. The Coastal Management National Framework, approved by RMIEPA but not yet endorsed by the Cabinet, will hopefully provide a basis for filling the gap. In terms of fire risk, the lack of land-use planning and zoning has resulted in houses being built too close together in overly narrow streets, resulting in a major fire risk for parts of Majuro and Ebeye.

■ ***Responsibilities often reside within bodies incapable of fulfilling their obligation.***

As an example, local Majuro Government is given the responsibility of collecting community solid waste for delivery to the dump managed by Majuro Waste Company. The system is undermined when the local government experiences financial problems.

■ ***Absence of effective building codes.***

Poorly designed buildings exacerbate the risks from typhoons, storm surges, and fires. Building codes have not been en-

acted, despite having been drafted over a decade ago. There is currently no control over design and location of buildings once land is acquired. Mortgages obtained from private banks do not require adherence to specific building standards. Especially in urban areas, the lack of building codes has been increasing the potential for disaster.

Coordination among government agencies

Current situation. In terms of disaster risk management, coordination has been largely the preserve of the National Disaster Council (NDC) and its operational arm, the National Emergency Management and Coordination Office (NEMCO, formerly the National Disaster Management Office). The NDC is chaired by the NEMCO Chief Secretary whose office (CSO) has 3 deputies and 5 support staff and reports directly to the President. The NDC functions, as provided by the National Disaster Act 1994, relate largely to disaster response, not disaster prevention. In addition, with the recent attention to disaster risk reduction and the implementation of the NAP, a National Action Plan Implementation Unit (NAPIU) will be established under the NEMCO Chief Secretary. The NAPIU will be headed by a Deputy Chief Secretary and will convene a task force, chaired by the Deputy, comprised of relevant line agencies for NAP implementation.

The success of NAP implementation will depend heavily on the cooperation of, and coordination with, local government, civil society, and the private sector—the level at which risk reduction measures will be taken. For this reason, local government was engaged throughout the NAP development.

In terms of climate change, the responsibilities for coordination of both national and international obligations fell originally to the RMIEPA, established under the National Environmental Protection Act 1984. However, the RMIEPA has a small staff and

budget for carrying out multiple responsibilities, including water quality monitoring, solid waste monitoring, public awareness, and coastal management. With the mounting number of international obligations and other factors, including those for the United Nations Framework Convention on Climate Change (UNFCCC), the Office of Environmental Planning and Policy Coordination (OEPPC) was established.

The OEPPC derives its legal mandate from the OEPPC Act 2003. The main duties of OEPPC include the following:

- Provide policy advice to the President and Cabinet;
- Ensure adequate attention is given to addressing the international commitments of RMI made through the international treaties;
- Ensure that activities arising from associated international conventions are linked to national priorities; and
- Collaborate with other government partners, NGOs, and communities in implementing environmental projects and programs.

These duties explicitly include and emphasize climate change and are guided by Vision 2018 “to assist RMI meet external and internal challenges and mitigate the threat to our sustainable development and livelihood and indeed our very survival from the effects of global warming/climate change on biodiversity, land degradation, and sea-level rise”. During the 10-year period (2008-2018), the OEPPC has two prime objectives: (a) prepare a Climate Change Policy in collaboration with the RMI Energy Policy; and (b) prepare RMI Adaptation Strategies to Climate Change.

The OEPPC is now the focal point for climate change issues and the channel to the relevant international agencies and donors. It is located in the Office of the President. The OEPPC seeks international do-

nor support for projects and, if successful, coordinates their implementation across sectors.

Impediments and solutions. In general, one major impediment to coordinating DRR implementation has been the lack of attention given by NDC and NEMCO in the past to risk reduction (in contrast to disaster response and recovery). In order to effectively carry out their coordination role among relevant government agencies, this requires some re-orientation and up-graded skills within NDC and NEMCO, a process that began with the development of the NAP.

Seeking the synergies between disaster risk reduction and climate change adaptation is potentially hampered by the roles and responsibilities for the two areas of risk reduction allocated separately to NDC and OEPPC. Care needs to be taken to ensure close coordination between these two government agencies in order to identify mutual objectives and areas of collaborative activity.

There are two other major impediments to the implementation of the NAP that need to be overcome:

- ***Lack of resourcing and staffing of the NAP Implementation Unit.*** A critical operational impediment to the NAP, and therefore to mainstreaming and implementation, is the resourcing and staffing of the NAPIU. A strong NAPIU will be the key to NAP success. Without it, the coordination and direction of the various sector agencies will not be achieved. In particular, the support provided by a technical expert will be critical.
- ***A large disconnect between national government and governments, civil society, and the private sector at the local level.*** Many local councils, particularly in the urban areas, are broke and owe money. As a consequence, their neglected responsibilities for such critical services like solid waste management could lead to a potential health disaster. Lo-

cal land owners have the power to hold sway over decisions regarding land use and have used that power to thwart efforts aimed at land use regulation, zoning, and building codes aimed at risk reduction. The national and local levels need to be better coordinated to obtain a common vision for risk reduction. In many respects, this will require government endeavor to extend the participatory approaches initiated during the development of the NAP into its implementation phase.

Coordination among donors and key stakeholders

Current situation. The RMI and the United States have a strong relationship of mutual assistance as encapsulated under the Compact of Free Association (COFA), which went into effect in 1986. Certain provisions of the COFA, including economic assistance, expired in 2001 and have been subsequently renegotiated for an additional 20 years commencing in May 2004. Under the COFA relationship, the United States provides guaranteed financial assistance administered through the Office of Insular Affairs in exchange for certain defense rights, including the lease of 11 islands on the Kwajalein Atoll. The RMI actively participates in all Office of Insular Affairs technical assistance activities and has unique access to many U.S. domestic programs, including disaster preparedness, response, and recovery programs through the Department of Homeland Security and the Federal Emergency Management Agency (FEMA).

With past arrangements expiring in December 2008, FEMA has underpinned RMI in terms of providing disaster response and recovery. The United States and the RMI will seek to reach an agreement to modify the arrangement for disaster response to include a greater role for USAID, as well as the United Nations. The transition from FEMA to USAID will require a review and amendment of existing protocols and operating proce-

dures between relevant agencies. Because USAID tends to concentrate more on training and capacity building, the implication of the transition is that RMI should take over responsibilities for DRM, including a greater incentive for disaster risk reduction. Under the amended agreement, the RMI will be able to request disaster assistance from USAID in a declared state of emergency, after utilizing the national Disaster Assistance Emergency Fund (established by the amended agreement as a first resource for disaster response), and requesting international assistance through the United Nations.

Apart from the United States, other key international development assistance partners include the Republic of China, Japan, the European Union, and the Asian Development Bank. In terms of the NAP, a full list of general and specific areas of interest of the members of the Partnership Network (the Partnership Capability Matrix) in relation to the implementation of the NAP is available from SOPAC and from NEMCO and should be referred to in identifying donor agencies and partners to help support NAP implementation.

The donors who have expressed interest in supporting the NAP include:

- **African, Caribbean and Pacific Group of States/ European Union Natural Disaster Facility within the SOPAC Community Risk Program** (Euro 1.868 million over 4 years commencing from 2008 for disaster risk reduction and DRM for 14 countries, including RMI). For those countries that have a National Action Plan, SOPAC will identify implementation targets. The purpose is to support NAP development and implementation. This commitment is to be executed by SOPAC.
- **AusAID NAP Facility with SOPAC Community Risk Program** (A\$2.265 million over 4 years commencing from 2008 for disaster risk reduction and DRM for 14 countries, including RMI). For those countries that have a NAP, SOPAC will identify

implementation targets. The purpose is support for NAP development and implementation. This is also to be executed by SOPAC and focused on direct implementation. A\$765,000 was to be committed by June 2008.

- **SOPAC Community Risk Program** (Total FJ\$6.5 million core annual program budget for 2008, out of which an initial F\$50,000 is earmarked for the review of disaster plans and legislation activities of the RMI NAP). Other NAP activities and action would be considered by SOPAC (e.g., Comprehensive Hazard and Risk Management). Other SOPAC programs out of which support could come include Oceans and Islands Program (for bathymetric and coastal mapping) and Community Life-lines Work Program (under Water Unit and Information and Communication Technology Unit for hazard maps and imagery).

Other possible players might include United Nations Development Program, United Nations Children's Fund, International Federation of Red Cross and Red Crescent Societies, and regional organizations such as Secretariat of the Pacific Community and Secretariat of the Pacific Regional Environment Program.

Impediments

- **Lack of donor assistance.** Some donors are not providing further assistance because the RMI is in arrears with outstanding loans.
- **Absence of a comprehensive donor coordination process.** This absence increases the risk of critical gaps going unaddressed and the danger posed by assistance provided out of sequence and not adding value or building on previous successes.

Planning and budgetary processes

Current situation. In general, the planning and budgetary processes across many sectors in RMI are poor-

ly carried out. As a result, it is difficult to get critical capital expenditures required for risk reduction explicitly targeted in the budget. According to one senior planning official, the problem is due to a combination of lack of willingness, awareness, and accountability, and lack of available funds (of the RMI recurrent budget about 90 percent funds personnel). Since performance-based budgeting is limited to only a few sectors of government, such as those receiving COFA support, personnel are generally not accountable. As a consequence, any available funds are dissipated and critical needs go unfunded.

The solid waste problem has reached crisis proportions because of deterioration of collection bins; the state of sanitation is similarly critical. The water sector has had no new capital expenditure, and the delivery of water in Majuro is now rationed to two days per week. There is only one water truck for emergencies for Majuro (for a population of 28,000) and no truck for Ebeye. The health sector faces real risks of epidemics, as identified in the NAP, especially of water-borne disease. The Health Ministry does not consider water quality its responsibility; water quality is currently within the purview of the RMIEPA (which is underfunded and under-staffed, with four staff to handle water quality monitoring in all of RMI).⁵ The fire risk is extreme, especially in Majuro and Ebeye. For five years there has been approval for two fire trucks, which can be acquired with donor support, but they have not been purchased because of failure by government to appropriate the required 25 percent matching funds.

There are essentially no systematic planning processes for disaster. There is no testing of response mechanisms or assessments of critical facilities, which can underpin budgetary requests. With regard to fire risk,

for example, the state of pumps, hydrants, access, and transport is not clearly known. Each year there is an appropriation of US\$400,000 (half from the United States) for disasters. However, it is a stationary fund that is only drawn upon in the event of disaster (not for prevention or preparedness); if disaster does not strike, the fund accumulates (at present it stands at about US\$2 million). There are efforts underway to modify the budgetary process so that the funds can be drawn down to a certain level for purposes of funding disaster prevention activities.

For local government, some funds are disbursed from the national government to local councils on an annual basis in relation to the size of the population being served; but council funds are derived largely from sales tax. Several of the northern atolls have sizable trust funds (up to US\$120 million from the United States for nuclear weapons testing compensation). Additional funding for capital projects is sometimes allocated from donor funding or U.S. federal grants.

In terms of NAP implementation, the NEMCO Chief Secretary, whose office has jurisdiction of the NAPIU, prepares and presents the budget to the Cabinet with input from various committees. Thus, there is potentially a strong integration of planning and budgetary process for NAP-related actions and activities. At present an initial start-up budget is available to organize the NAPIU.

However, the larger problem overall pertains to the lack of strategic planning and performance-based budgeting in the majority of government agencies. Currently, only a few government agencies (like those that receive COFA funding, for example, the RMIEPA) develop strategic plans and have performance-based budgeting. Until this underlying deficiency is addressed, it is likely that main-

⁵ The incidence of gastroenteritis now averages about 2,000 cases per year in Majuro; for Ebeye, with a population of about 10,000, the rate is 1,100-1,300 per year. Ebeye recently had a cholera outbreak, and there were cases of typhoid. The U.S. Center for Disease Control in Atlanta, Georgia, was obliged to visit RMI twice within the last several years.

streaming and implementation of risk-reducing activities and actions will be effectively or efficiently managed.

Impediments

- **Lack of identified long-term support for sustained implementation of NAP.** The NAP implementation planning is largely focused on externally supported technical assistance. The matter of sustainability needs to be addressed. The operational (recurrent) budget is already over-stretched and may undermine operational activities within the NAP. There are already inadequate resources available to support ongoing activities and no easily identified opportunities for new resources to support expanding government services.
- **Absence of strategic planning and performance-based budgeting within government.** Until some rigorous form of accountability is enforced, like performance-based budgeting, risk reduction in general and the NAP in particular will face serious implementation problems.

Implementation of actual risk-reducing measures

- **Current situation.** The current situation can be characterized by the state of on-going operational activities related to risk reduction, and by specific NAP-related projects.

For operational activities, there is limited success in implementing risk-reducing measures in RMI. The positive actions that are taken (e.g., in water quality monitoring, control of sand dredging, expansion of water storage facilities) tend to be swamped by the magnitude of the problems. The slow accumulated degradation of the natural and social systems is diminishing the resilience to natural and human-induced hazards. In some cases, the situation is actually quite dismal, which is illustrated by the following examples:

For droughts and diseases risks

- In Majuro Atoll, even in non-drought times, reticulated water is supplied intermittently, only two days per week. In Ebeye, there is intermittent supply on a community-wide basis. In the interim periods of low water pressure in the pipes, the water is often contaminated as a result of infiltration.
- The reticulated water system in Majuro has high levels of unaccounted losses. It is estimated that between the well field at Laura and the reservoir near the airport up to 66 percent of the flow is lost to leaks.
- Roof catchment tank systems are expanding throughout the atolls, but capacity for proper design and maintaining safe quality of water from such sources is not keeping pace. Cases of gastroenteritis are high and increasing, and Ebeye experienced a recent outbreak of cholera.

For typhoon, high surf and disease risks

- In Majuro Atoll, the coastal system continues to be degraded with dumping of solid waste.
- Reticulated sewage is disposed untreated. In Majuro, the pipe extends to a depth of 25 meters just over the edge of the reef flat but is reported to be damaged and leaking at the surf level.
- Septic tanks are not emptied, and widespread leakage in the coastal environment occurs frequently because of high water tables and pollutes the coastal and marine environment.

On the positive side, the improvements in forecasting of El Niño/La Niña rainfall conditions, issued from the Pacific ENSO Applications Climate Center in Hawaii, have proven to be beneficial in allowing preparation and adjustments to water supplies and usage. For example, for the 2003 drought, the impacts were reduced due to actions taken based on prior warning. The RMIE-PA has had some success in implementing activities and strategies identified in its EPA Strategic Plan 2004-2007,

including development of the RMI Coastal Management National Framework, strengthening the GIS capacity, awareness raising, and conducting environmental impact assessments on development activities. Following the 1998 El Niño-related drought, the Government and FEMA began providing water tanks to outer island communities.

Several projects related to NAP goals are underway:

- **European Union B-Envelope water supply.** While the NAP is not yet endorsed by the Cabinet, there are already several objectives pertaining to NAP Goal 5, *Access to safe and adequate clean water at all times*, that are being implemented by the EU B-Envelope Fund (net Euro 935,000). The overall objective of this project is to improve the reliability of dry season and drought-period water supply to the urban and rural people of the Marshall Islands. The specific components of the project include:
 - ❖ Outer island household rainwater harvesting provision,
 - ❖ Urban rainwater harvesting provision,
 - ❖ Improved rural and urban rainwater harvesting management,
 - ❖ Improved drought yield of national airport runway rainwater harvesting,
 - ❖ Protection of Majuro's groundwater resources for future drought supply.

The partners in the implementation of the project include Ministry of Health, RMIEPA, Majuro Water and Sewerage Corporation, Public Works Department, Youth for Youth for Health, and Women United Together in the Marshall Islands.

- **Rongelap Atoll local government, conservation, and sustainable development project.** This initiative is being supported with the income derived from the Atoll's Trust Fund (which totals US\$60 million

from the U.S. nuclear testing compensation) along with US\$2 million per year from an individual philanthropist. The project is taking a holistic approach to sustainable development of the island, which has a pristine marine environment and from which the inhabitants have temporarily been relocated. The activities include a marine research center, a marine sanctuary, aquaculture, and eco-tourism. This includes breeding of marine species. The research is expected to lead to commercial activities and, with eco-tourism, to economic diversification and self-reliance (relating to NAP Goal 7, *Reduce economic dependency of the outer islands*). The infrastructure has been built along with a number of houses, constructed to USDA risk standards for wind stress and minimum floor heights to reduce risks from typhoons (relating to NAP Goal 6, *Sustainable development of the coastal area*). Reverse osmosis desalination has been acquired, and rainwater catchment tanks are part of each housing development (relating to NAP Goal 5, *Access to clean water*). A proposal has been submitted for establishment as a World Heritage Site.

- **Integrated Water Resource Management Project for Laura groundwater protection.** Funding of US\$0.5 million comes from GEF to implement the groundwater protection activity noted in the EU B-Envelope project noted above (relating to NAP Goal 5, *Access to clean water*).
- **Pacific Hydrological Cycle Observing System Program.** The program focuses on (a) working with the RMIEPA and Majuro Water and Sewer Company on several management issues and capacity building; (b) provide equipment for water quality management; (c) assist with the rehabilitation of the Laura lens and groundwater monitoring; and (d) support for outer Pacific Islands for water quality and assessment.

Gaps or impediments

- *Lack of incorporation of CCA in DRR.* In the projects noted above, there is no systematic consideration of present drought risk or the effects of future climate change and how it may affect risks to water supply. There are several water resources development initiatives (e.g., outer Pacific Islands rainwater harvesting, integrated water resources management of Laura lens), and yet there does not appear to be any future climate change scenario or short-term drought proofing included in the project design and planning. Therefore, there will be no specific consideration of climate change adaptation. The actions to be taken will not be explicitly “climate-proofed”.
- *Land tenure system and power of landowners.* The JICA began a project to double airport water storage (from 32 million gallons); landowners opposed the project, and so it was put in abeyance.
- *Failure of local government to implement.* In the chain of connections from policy, planning, regulations, monitoring, enforcement, and action, implementation often appears to be stymied by the failure of local government to carry through on its responsibilities. For example, while the enabling environment for land use regulations and zoning has been available at the national level for quite some time, enactment, which is the responsibility of local government, has been hindered. ❖

Opportunities for Investment

From this RMI assessment, it is evident from the gaps and impediments that many opportunities for investment leading to the improvement of risk reduction can be identified. Indeed, the NAP and the ADB (2005) report both identify considerable priorities, strategies, and actions necessary for environmental improvement and hazard management, including risk reduction, for RMI.

This assessment highlights country status, gaps, opportunities, and barriers related to national policies, strategies, plans and activities with regard to the management of natural hazards in RMI. This focus extends to the enabling environment for a comprehensive risk management approach to natural hazards and the capacity to undertake such a comprehensive approach, including institutional arrangements, human resources, public awareness, information, and national budget allocations. In most discussions among key government officials and other stakeholders, investment programs are prioritized and selected based on expectations of several criteria (costs, available funding, efficiency, expected benefits, institutional, financial, legal and related capacity).

The RMI and most of the Pacific island countries already have established policies, institutions, systems, and related structures to address DRR/CCA challenges. Several programs (NAPs, NAPAs, etc.) are ready to be enacted. However, there are significant gaps in the 5 key HFA priority areas discussed; additionally, while some efforts have been made to address certain issues, others (funding, staffing and related operational support) persist. High-yielding, short-term priority issues have been identified by several participants; however, it appears that more effort is needed to fully categorize such needs and decide upon appropriate corresponding short-, medium- and long-term programs.

The RMI policymakers, sector officials (in consultation with local stakeholders), and various donors and

financial institutions identified the list of priorities. The Government could choose to pursue any of these options with its own resources, with support from the international donor community, and/or international financial institutions such as the Asian Development Bank and the World Bank. Grant funding for RMI is being mobilized from the Global Facility for Disaster Reduction and Recovery to support pilot programs, which could be leveraged to undertake some of the proposed investments, based on demand. Funding would be expected to support programs from 2009-11.

In narrowing the field of opportunities, this report has applied two additional sets of filters or criteria. The first set of criteria helps select those opportunities that achieve the following:

- Address risk reduction directly;
- Are likely to produce tangible results within three years;
- Are likely to have longer-term sustainable benefits; and
- Have in-country commitment, champions, and/or institutional arrangements to promote implementation.

With this set of criteria in mind, and with consultation and expert judgment, 6 priorities for investment were identified in RMI. These 6 investment opportunities, along with a summary of the rationale for each in relation to the above criteria and as linked to the assessment report's discussion, follow:

- (1) *Strengthening capacity of the National Emergency Management and Coordination Office*, under which the NAPIU will operate, with support in form of technical assistance. The success of the NAP depends heavily upon ensuring that NAPIU has strong capacity for technical advice, leadership, and coordination. The NAP has garnered

significant in-country commitment having been produced by an extensive, inclusive process of consultation with local government, civil society, and the private sector. The institutional arrangements—placing the NAPIU within DRC/NEMCO under the Chief Secretary’s Office within the Office of the President—give NAP implementation strong positioning within government. Within three years, the preliminary implementation plan should be advanced and set the stage for implementation of the longer-term action plan.

- (2) *Developing an information management system.* Such a system does not currently exist. The actions under the NAP (and other DRR and CCA actions) require cross-sectoral, cross-governmental (national to local) collaboration and integration of effort. That effort requires a system of organization, storage, and sharing of data and information, including communication and knowledge sharing with outer Pacific Islands. Technically, such a system could be established well within a three-year period and, once established, would have long-term benefits in facilitating integrated action across agencies and sectors. To be successfully implemented, the information system should be strongly championed by NEMCO.
- (3) *Enhancing community-based awareness, education and participation in risk-reduction and resilience building.* It is widely acknowledged in RMI that more engagement across all levels, from national decisionmakers to the outer island communities, must be encouraged. Participation of local government, communities, civil society, and the private sector are essential for DRR/CCA success. There is strong endorsement of this opportunity by the Disaster Risk Center—a likely champion for NAP—that views it as essential for the successful implementation of NAP. While building a complete bridge between the national and local level is a long-term process, substantial progress in building a strong foundation can be made in three years.
- (4) *Climate proofing new water supply developments.* The RMI is poised to embark on a number of projects, especially with regards to bolstering water supply systems in order to reduce the risks from drought. These include both individual and community water-harvesting projects. However, in general, these projects are not taking climate variability and change explicitly into account in terms of designing to acceptable levels of risk. Here is an excellent opportunity, with minimal additional support required, to maximize the synergy between disaster risk reduction and climate change adaptation with actual on-the-ground risk-reducing measures. The climate-proofing measures would “add value” to efforts that are underway to enhance water supply systems. The timeframe for implementation is short, well within three years. The on-the-ground benefits however are long term and promote sustainable water resources in the face of future climate change.
- (5) *Reviewing and revising draft building codes.* Revised codes should ensure that disaster risk reduction and climate change adaptation are incorporated explicitly. While RMI has had draft building codes for nearly two decades, local governments have never enacted them. The RMI government, as voiced by the NRC, the OEPPC, and the EPPSO, stresses the paramount importance of instituting building codes. While there has been past failure to enact draft codes, it is felt that changing circumstances are now more favorable for enactment, particularly if awareness raising and greater participation in disaster risk reduction and climate change adaptation are pursued. The reviewing and revising of draft building codes is contained with the NAP as an action item. The required timeframe is short, within three years, but the benefits, if enacted, are long term and sustainable in terms of resultant effects.

(6) *Early warning response*. This priority item includes assessing and identifying the gaps in warning systems, and reviewing and improving dissemination and public perception and response measures. This priority item in the NAP is also a key component of both the regional DRR and CCA frameworks for action. The recommended priority in terms of early warning is to focus on the communication and response measures that would reduce vulnerability, rather than focus on the physical warning system itself. This could be achievable with an operational pilot program within a three-year period and would set the stage for a longer-term, sustainable program.

These 6 opportunities for investment were then subjected to a second filter by asking the question: *Which of the opportunities are already or likely to be supported by other donors and agencies?* The intent of applying this criterion is to see where the World Bank can add value in a coordinated and harmonized manner in terms of other players in the region. Two of the 6 opportunities have support from other regional groups: Opportu-

nity (3), *Awareness raising*, is slated to be taken up by SOPAC; and (6) *Early warning response*, has several interested donors, to be coordinated by SOPAC.

On this basis, there are 4 complementary projects that could be supported by the World Bank: (1) *Support to the NAPIU*; (2) *Development of the information management system*; (4) *Climate-proofing of new water supply systems*; and (5) *Updating of building codes*.

While the priorities listed above reflect a great deal of consultation and analysis, the impediments and gaps previously noted in the report could create serious obstacles if they are not addressed as part of the program preparation process.

In the tables of Annex A, each of these opportunities is expanded to provide preliminary information on indicative costs, timeframes, and first-order actions and tasks. This information is intended to be sufficient for the development of detailed proposals and should the World Bank wish to pursue these opportunities for investment. ❖

Annex A. Proposals for Support to RMI

Proposal	M4 Review, revise and promote building codes				
Country/sector	Republic of Marshall Islands: Settlements, infrastructure				
Goal and purpose	Achieve “climate-proofed” development by ensuring that new buildings and infrastructure follow standards that explicitly incorporate DDR and CCA to acceptable design levels.				
Scope	National				
Lead agency	CSO with NDC, NEMCO				
Cost and duration	US\$200,000 over 2 years				
Hazards targeted	Risk reduction measures	Key gaps/barriers	Tasks	Cost US\$k	Time-frame
All	Risk-reducing building and infrastructure design standards and codes	Draft building codes were never enacted and are out of date Obstruction at level of local government where building codes have to be enacted	Recruit TA support in order to: Review the draft building codes and identify potential areas for improvement and strengthening with respect to risk reduction. Develop preliminary set of options for revision covering range of hazards Hold consultative workshops with local governments and communities in order to incorporate stakeholder views and preferences Revise draft based on outcomes of consultation Identify key proponents of building codes within government and promote government approval	20 60 40 40 40	Year 1 1 month Year1 3 month Year 1 2 months Year 2 2 months Year 2 2 months

Annex B. Project Team and People Consulted

Project team

Alf Simpson	Consultant, Australia
Richard Warrick	Consultant, New Zealand

Supported by

Moses Sikivou	Manager, Community Risk Program, SOPAC
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Persons consulted (Country visit, May 5-11, 2008)

Yumiko Crisostomo	Director, Office of Environmental Planning and Policy Coordination
Carl Hacker	Director, Economic Policy, Planning and Statistics Office

RMI Mayors

Wilson Note	Bikini Island
James Matayoshi	Rongelap Island
Danny Matthew	Utrik Island
John Kaiko	Utrik Island

Other officials

Jorelik Tibon	Deputy Chief Secretary (Chair), NAP Task Force
Jemi Nasion	Ministry of Finance
Imang Chong Gum	Ministry of Public Works
Alington Robert	Majuro Water & Sewerage Co.
Bermen Laukon	Majuro Energy Co.
George Lanwi	Police Commissioner, Department of Public Safety
Wilbur Heine	Ministry of Internal Affairs
Carl Hacker	Economic Planning Policy & Statistics Office (EPPSO)
Ronny Jacob	Ministry of Education
Clement Capelle	NEMCO
Justina Langidrik	Ministry of Health
Reginald White	Meteorologist in charge, Weather Service Office
Abraham Hicking	Water Quality Manager, Environmental Protection Agency
Casten N. Nemra	Chief Secretary, Office of the President
John Bungitak	General Manager, RMIEPA
Tommy Kijiner	Ministry Research and Development
Roger Cooper	Majuro Waste Co.

Bibliography

- ADB (Asian Development Bank). 2005. *Republic of Marshall Islands: Country Environmental Analysis*.
- ADB. 2004. *Pacific Region Environmental Strategy 2005-2009: Executive Summary*.
- Bettencourt, Sofia, Richard Croad, Paul K. Freeman, John Hay, Roger Jones, Peter King, Padma N. Lal, Alan Mearns, Geoff Miller, Idah Pswarayi-Riddihough, Alfred Simpson, Nakibae Teuatabo, Ulric Trotz, and Maarten van Aalst. 2006. *Not If, But When – Adapting to Natural Hazards in the Pacific Islands Region – A Policy Note*. Pacific Islands Country Management Unit, East Asia and the Pacific Region, World Bank.
- Chunting Xue. 1997. SOPAC Report.
- GEF (Global Environment Facility). 2008. *GEF-Pacific Alliance for Sustainability - Program Framework*.
- Geoscience Australia. 2008. *A Natural Hazard Risk Assessment of the Asia Pacific Region*.
- Government of RMI. 2008. *National Action Plan for Disaster Risk Management 2008-2018*.
- . 2008. *Majuro Water Safety Plan (Draft)*. Majuro Water & Sewerage Co.
- . 2006. *Climate Change Strategic Plan (2006)*. OEPPC, Office of President
- . 2006. *RMI Coastal Management National Framework (draft)*, RMIEPA.
- . 2005. *Standard Mitigation Plan 2005-2007: Final Draft*.
- . 2003. *Disaster Preparedness and Mitigation Act 2003*.
- . 2003. *Office of Environmental Planning and Policy Coordination Act 2003*.
- . 2001. *Vision 2018: The Strategic Development Plan Framework 2003-2018*.
- . 1988. *Coast Conservation Act 198.8*
- . 1987. *Planning and Zoning Act 1987*.
- . 1984. *National Environmental Protection Act 1984*.
- Pratt, C.R., and Mitchell, J. 2003. *EVI Country Profile Review – Marshall Islands*. Miscellaneous Report 522. SOPAC.
- SOPAC (Secretariat of the Pacific islands Applied Geoscience Commission). 2007. *Integrated Water Resources Management in Pacific Island Countries- A Synopsis*.
- . Nd. Various country diagnostic reports.



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**In bold, GFDRR Donors*