



# Technical Assistance Consultant's Report

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## Regional: Mainstreaming Environmental Considerations in Economic and Development Planning Processes in Selected Developing Member Countries (Financed by TASF)

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For ADB

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**Asian Development Bank**

**ASIAN DEVELOPMENT BANK**

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# **REPUBLIC OF THE MARSHALL ISLANDS**

## **COUNTRY ENVIRONMENTAL ANALYSIS**

**Mainstreaming Environmental Considerations in  
Economic and Development Planning Processes**



**FINAL REPORT**

**Prepared by: John E. Hay and Ellia Sablan-Zebedy**

**August, 2005**

## **Executive Summary**

1. The Asian Development Bank (ADB) uses the country environmental analysis (CEA) as the tool to assist with early incorporation of environmental considerations into the country strategy and program (CSP) for its Developing Member Countries. The CEA provides targeted information necessary for informed decision making on environmental constraints, needs, and opportunities, including those that impinge upon poverty partnership agreements, as appropriate. The focus is on adding value to planned and ongoing development initiatives by reducing environmental constraints and exploiting environment-related opportunities.

2. This CEA for the Republic of Marshall Islands (RMI) describes the environmental issues that are most important to RMI's development strategy as well as ADB's role in helping remove the environmental constraints on sustained development. The CEA is directed in part at the policy, program, and sector levels, but the principal focus is on identifying how opportunities and constraints presented by the environment and natural resources of the RMI can be address by way of environmentally sensitive projects in the assistance pipeline.

3. Thus the present CEA for the RMI focuses on the general environment status and trends in RMI, including the role of the environment and natural resources in the economy, the key environmental constraints and opportunities, the policy, legislative, institutional, and budgetary frameworks for environmental management, and principal constraints on, and barriers to, improved environmental management. It also identifies priority improvements in policy, institutional and legislative mechanisms, as well as programs and projects that will help to mainstream environmental concerns into economic development planning.

### **Policies, Budgets and Legal Frameworks**

4. The principal policy instrument guiding the sustainable development of the Marshall Islands for the next 15 years is the Strategic Development Plan (SDP) 2003-2018 or Vision 2018. The SDP was prepared in June, 2001 and approved by the Nitijela in October 2001. It links ten major challenges the country has faced over the last 15 years with ten broad national goals and objectives aimed at fostering sustainable economic development. The SDP envisions that a review of the progress of the SDP be carried out after 5 years – the first review should therefore take place in 2007.

5. In addition to the SDP, a set of Master Plans accompanied by Action Plans were to be developed. In order to facilitate their implementation a National Policy Coordination Committee (NPCC) was to be formed, with a mandate to integrate the development policies into national planning and budgeting and advise the Cabinet of its progress. Regrettably, the Master Plans and accompanying Action Plans have not yet been developed, and the proposed NPCC has not yet been established. Instead the National Planning Office was revitalized into the new Economic, Policy, Planning and Statistics Office (EPPSO), which is mandated to monitor and evaluate the progress and development of the country. New priorities and action plans have been established, but the environmental sustainability development priorities as set out in the SDP have yet to be mainstreamed into the current strategic develop plans of Government ministries and agencies.

6. Until recently there had not been a formally appointed Government body tasked to monitor and report on the status of the Millennium Development Goals (MDGs). A National MDG Task Force has yet to be formally established. However, to begin developing a framework for MDG monitoring and reporting, in 2004 EPPSO formed a partnership with the United Nations Development Programme (UNDP) to establish a program office within EPPSO. In addition to other UNDP duties, the UNDP Program Manager is tasked to provide

assistance to EPPSO to monitor and report on the MDGs, and to provide technical support to the National MDG Task Force, upon its establishment.

7. The RMI has in place a commendably comprehensive and appropriate array of policy, legal, institutional and budgetary frameworks for environmental management and sustainable development. However, despite some recent notable improvements in environmental performance, in many areas and respects practical reality falls far short of the potential the above frameworks allow and should facilitate. For example, land use planning and zoning is effectively non-existent, meaning there is ad hoc and often conflicting use of land, with activities often conducted in areas where environmental impacts will be higher than might be the case in other locations. Severe limitations on the Government's access to land also lead to ad hoc and politically expedient placement of infrastructure. This often delays and increases the costs of provision of services such as water supply, and management of solid waste and waste water. The absence of effective controls on siting and construction of buildings has adverse consequences not only for the environment but also for human health, safety and wellbeing.

8. At the national level, RMI has legislation related to environmental protection, coastal conservation, planning and zoning, management of marine resources, preservation of cultural and historic properties, protection of public health and safety and of endangered species. In most cases the legislation allows for Ministries to pass and enforce regulations, usually on approval of a representative authority or council. In addition to the Environmental Protection Agency (EPA) and the Marshall Islands Marine Resources Authority (MIMRA), other important environmental and resource management institutions have been established by legislation, including the Office of Environmental Protection and Policy Coordination (OEPPC) and EPPSO. In many cases legislation also gives a mandate to Local Government Councils to pass and enforce ordinances. Proposed ordinances are submitted to the Minister of Internal Affairs, who passes them on to the Attorney General's Office (AG) for final review. The AG's Office has the responsibility to ensure all Local Government ordinances are consistent with national legislation and regulations.

9. The RMI is party to many international and regional environmental and resource management agreements, one of the latest being the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

10. Since the signing of the Amended Compact of Free Association with the United States in 2003, the National Government has made institutional changes and adjustments in order not only to promote good governance and accountability within its institutions, but also to comply with the Amended Compact Fiscal Procedures Agreement. The Ministry of Finance has been the focus of these reforms. It has upgraded its financial management systems for all of its financial operations and now prepares on a rolling annual basis a Medium Term Budget and Investment Framework to assist the National Government in budget planning. This process has helped to eliminate short-term budgeting and ad hoc financial fixes that have mired the RMI's development in the past years. In addition to the Framework, EPPSO and the Ministry of Finance are also assisting the various ministries to develop and implement performance-based budgeting. Until 2002 Government ministries and statutory bodies/agencies had utilized traditional line budgeting.

11. Between 2001 until 2003 the National Government negotiated the new Compact agreement. By the end of 2003 the Amended Compact of Free Association with the United States was approved by both parties. The Compact's amended economic assistance package is a major change in that it involves: 1) financial assistance that is more than the former Compact's annual grant assistance, and without the injurious 5-year step-downs as experienced during the past Compact's term; 2) the continued application of various Federal programs and services; 3) a new term of 20 years versus the former 15 years with a new

trust fund mechanism that will help provide budget stability in the post grant assistance era; and 4) a Compact grant-related fiscal management approach that aims towards accountability and achieving results.

12. The Environment Sector Grant under the Compact is intended to increase environmental protection; establish and maintain conservation areas that achieve sustainable use; support environmental infrastructure planning, design, construction and operation; and involve the citizens of the RMI in the process of conserving the nation's natural resources. In the past, EPA's entire core funding has come from the National General Fund and Grant funds. However, in light of the new Amended Compact agreement, and under certain circumstances, EPA's current funding sources also include those from the Amended Compact and Special Revenue. In the budget planning for fiscal year 2005, EPA's entire core funding from the National General Fund was significantly reduced and replaced with money allocated from the Amended Compact. As a result total EPA funding decreased by \$356,261, from \$956,920 to \$600,569. The OEPPC, on the other hand, is mainly funded through the National General Fund and from Grant funds and does not receive any funding via the Amended Compact.

13. The Office International Development Assistance, Ministry of Finance, is responsible for coordination of international development assistance. There is a large number and considerable diversity of activities supported by this assistance. While there are many complementary initiatives, there is no evidence of redundant or conflicting assistance.

#### **ADB's Assistance to the RMI**

14. ADB's strategic priorities for the RMI are: (i) enhanced public sector productivity, including improved access to basic social services; (ii) enhanced environment for private sector investment, job creation, and growth; and (iii) strengthened public sector governance. At the 2004 National Coordination Committee, reflecting the results of extensive consultations and participatory processes, and in support of the formal poverty partnership between RMI and ADB, a decision was also made to focus on prioritizing the CSPU in support of future efforts to reduce poverty, including the means to establish indicators and monitor progress. The CSPU also calls for a focus on greater community participation in development processes, to raise ownership and the demand for social and economic progress that is needed if the deeper, more systemic constraints to improved productivity are to be resolved.

15. Since RMI joined ADB in 1990 it has received 12 loans totalling \$78.1 million and 44 TAs totaling \$18.1 million. Two loans of \$15.5 million and five TAs of \$2.62 million were active as of mid 2005. Almost all loan funds come from the Asian Development Fund (ADF). While almost all the technical assistance is directed towards addressing the strategic priorities, the loans are not as highly focused, as measured in terms of either the number or value of the loans.

16. The 2005-2006 assistance pipeline for lending products includes two proposed loans: (i) Youth Social Services (total \$8.5 million with ADB funding \$6 million), and (ii) Urban Solid Waste Management (total \$10 million, with ADB funding \$7.5 million). Final ADB allocations will be determined under the revised performance based allocation policy. Upcoming non-lending assistance will include project preparatory as well as advisory capacity-building TAs. The 2005-2006 assistance pipeline for non-lending products and Services includes: (i) Urban Solid Waste Disposal and Management, (ii) Developing the Civil Service and Rationalizing Government Assets, (iii) Preparation of Economic Report, Improving Sector and Thematic Policy and Institutional Development, (iv) Strengthening Sector and Thematic Policy and Institutional Development (EPPSO II).

17. Only one loan and one TA are related to environmental management, specifically solid waste disposal and management. The TA aims to help strengthen ownership and effective demand, primarily among the poor, for improved public services and for improved urban environment (solid waste disposal). This will complement a project preparatory TA in Solid Waste Management in 2006, with a possible loan in 2007.

18. In past assistance only two TAs were specifically within the environment sector. However, the other TAs, and all loans, delivered environmental and related benefits indirectly, through such initiatives as water and wastewater infrastructure projects, and strengthening the tourism sector and fisheries management. There is consistency between the anticipated and actual environmental impacts of project implementation. These are appropriately small and hence acceptable. The sustained environmental and related impacts post implementation are overwhelmingly beneficial. Initiatives that enhance water and sanitation services in the urban centers are clearly going to generate significant environmental and related benefits, well in excess of the adverse environmental impacts during project implementation. But projects in the tourism and health sectors have also generated significant environmental benefits, albeit less directly.

### **Environmental Concerns and Constraints**

19. Participatory consultations, supported by studies of relevant policy and technical documents, resulted in identification of seven key environmental concerns: solid and hazardous waste management, contamination of ground and rain-water supplies, destruction of coral reefs, pollution of coastal waters, extremes and trends in sea level, accelerated coastal erosion and a potential for over-exploitation of renewable and non-renewable resources. The influences of changing environmental quality on livelihoods, health, and vulnerability of poor and other minority groups were also explored, as were the environmental performances of key economic sectors.

20. Concerns with the current ineffectiveness with the environmental impact assessment (EIA) regulations include absence of effective controls on dredging for construction aggregate and on earth moving activities. Littering is still widespread. Lack of secure access to potable water, in both the urban centers and Outer Islands, is reflected in the high incidence of waterborne illnesses. Some 25% of homes are still without adequate sanitation. Coastal erosion is widespread, on both developed and more natural coastlines and there is growing evidence of that both the coastal and offshore fisheries are being overexploited. These and other changes highlight the failure to arrest degradation of the environment and manage natural resources in a sustainable manner. The ability for effective dissemination of early warnings has not improved, despite lessons to be learned from recent occurrences of natural disasters, in the RMI and further a field.

21. The critical and systemic constraints and barriers to sound environmental management often manifest as a failure of Government to make, and implement in a timely manner, decisions based on advice from officials that is designed to result in good environmental outcomes. Politically expedient decision making may lead to sound advice being ignored. Decisions may also be made in the absence of sound advice due to it not being sought, due to inadequate time, expertise, equipment and funding being available to acquire and analyze the required information and compile the advice, and often due to a lack of effective coordination of information between Government agencies. As in most small island developing countries, information is difficult to obtain and there is little effective information sharing, even between Government agencies. Failure to achieve full exchange of relevant information is contrary to the EIA regulations and to best practice worldwide. The consequences for the developer are often severe delays and increased costs, if not total failure of the initiative due to a lack of popular support. The perception is that the EIA

regulations are developer unfriendly. The fault lies not with the regulations themselves, but with the Government and the developers.

22. Another impediment to improved environmental performance relates to the substantial, and growing, shortfalls in respect and cooperation between Government and the people of the RMI. Even when the Government is trying to take an initiative that is intended to benefit the public at large, perceptions may be such that the initiative is effectively stalled. Government is, in some instances, contributing to misunderstandings. The good work of Government is often impeded in areas where there are environmental and related implications. Aversion by landowners and leaseholders to cooperate with officials wishing to lease or access land, such as for the construction or servicing of infrastructure including utilities, impedes the ability of Government to ensure timely, efficient and effective provision of services which are in the interest of the wider public and the environment. Lack of cooperation can often be traced back to land owners and leaseholders perceiving, rightly or wrongly, that officials are not respecting their rights by failing to advise, consult, and inform them as to the Government's intentions and reasons, and in regard to the benefits (and adverse consequences) for those with an interest in the land. Informed landowners and leaseholders are unlikely to withhold cooperation when they are made aware of the benefits that will accrue to the wider community, if not to themselves directly.

23. The Government has considerable powers to enforce the current legislation and regulations. But it can likely achieve the same outcomes if it engages with the public in a more sensitive and timely manner, and with the intention of gaining informed consent and cooperation, rather than enforcing its powers. Enforcement should be used only as last resort. The private sector should also be encouraged, in a deliberate way, to adopt the same approach in its dealings with both Government and the public. All too often of late, developers in the private sector have made information available only to those parties in the Government, private sector and the community they consider will serve their interests. Currently there is no effective dialogue between those promoting foreign investment and the regulators of foreign investment activities. There are high levels of uncertainty in the implementation of policy and in the execution of laws and regulations.

24. One of the key barriers to gaining improved environmental and related outcomes is the lack of awareness amongst the public, and to some extent the private sector, of the intentions and procedures of Government. Government is perceived to be autocratic, insensitive to traditional and customary rights and practices and uncommitted to good practices in raising awareness and consultation. The consequences often come in the form of a standoff between Government on the one hand and landowners and/or leaseholders on the other. Sometimes the public at large are antagonistic and uncooperative. A best practice approach to awareness raising and consultation, using where appropriate traditional methods which underpinned respect and cooperation in the past, would go a long way towards giving greater effect to the existing environmental and related policies, laws, regulations and financial expenditures made by Government.

25. It is important to note that the above findings are not new, though the reasoning may give new meaning to the conclusions. For example, the CSPU 2005-2006 proposes that the country strategy for 2005 and beyond be refined to focus on greater community participation in development processes, to raise ownership and the demand for social and economic progress that is needed if the deeper, more systemic, constraints to improved productivity are to be resolved.

### **Priorities for Action**

26. There were three main considerations when identifying the priority areas for action, namely to reflect: 1) environmental constraints on development; 2) new opportunities where

the environment and natural resources can provide for economic development and social progress; and 3) strategies to alleviate poverty and hardship in the country. Eight priority areas were identified. Mainstreaming responses that address these priority areas will help ensure that the RMI will progress quickly towards achieving sustainable development.

27. The priority areas for action are:

- Improving Outer Island transportation;
- Developing copra oil as an alternative to diesel fuel in the Outer Islands;
- Combining traditional and modern approaches to land tenure, and to land use, and environmental planning legislation;
- Reducing risks to water quality and supply on Majuro, Ebeye and the Outer Islands;
- Disposing of solid waste in an environmentally sound manner, resulting in land reclamation;
- Combining traditional and modern methods for coastal protection and erosion control;
- Enhancing food security, especially in the Outer Islands; and
- Early warning systems for natural and other disasters (e.g. typhoons, tsunami, drought and disease).

28. To facilitate the mainstreaming process, the eight priority areas for action were incorporated into a road map for mainstreaming environmental management. The road map includes details on the current state of relevant environmental components, as well as targets, indicators, actions and the implementation time frame.

### **Implications for ADB's Intervention Programs**

29. A total of thirteen project interventions are proposed, in relation to six TAs (active or in pipeline), four loans (active or in pipeline) and three new TAs. The opportunities for, and constraints on, improving the environmental outcomes associated with ADB's assistance to the RMI were identified through a systematic analysis of the strengths, weaknesses, opportunities and threats (SWOT) in relation to addressing the eight priority action areas.

30. By mainstreaming environmental considerations into development planning and processes, activities related to the eight priority areas can be integrated into projects in the pipeline for ADB assistance to the RMI and also into ongoing projects. The opportunity to mainstream environmental considerations into the latter projects will arise only if and when projects are extended into a second phase.

31. In addition, three new TAs are proposed because there are few opportunities to realign and strengthen ongoing and programmed assistance in ways that would address the identified needs in three environmental priority areas, namely water quality and security, coastal erosion and vulnerability to natural and other disasters.

32. Landuse planning and building regulation are critical to ensuring effective responses to the documented need to improve access to secure supplies of water that meet drinking standards. Similarly, efforts to reduce and prevent coastal erosion and address coastal hazards are also dependent on being able to ensure that new development and current landuse practices avoid hazardous areas and also avoid exacerbating existing levels of hazard. The proposed assistance will also focus on harmonizing and optimizing the use of traditional and modern practices. This is best achieved by working at Local Government and community levels, with the role of National Government being to strengthen the enabling environment for the activities being undertaken at these levels. The proposed assistance related to early warning systems will address the residual hazards related to water security and coastal development, as well as hazards related to drought and outbreaks of infectious diseases.



33. In all three areas of proposed assistance the focus will be on building capacity, specifically by strengthening Local Government institutions and their technical capacity and through human resources development both within those same institutions and through education, training and community outreach programs.

34. The technical assistance projects proposed for the 2006-07 pipeline are as follows:

35. *Developing Policies and Procedures, and Enhancing Capacity Local Government Level for Land Use Planning and Regulation of Building and Other Development* - proposed focus is on identifying and implementing at Local Government level the strategies, approaches and mechanisms for land use planning, zoning and regulation of construction and other development activities, to achieve an appropriate and acceptable balance between delivering the desired economic, social and environmental outcomes and retaining traditional practices related to land tenure and use.

36. *Enhancing Early Warning Systems for Natural and Other Disasters* – proposed focus is on providing assistance for the implementation of two key components of RMI's new Disaster Mitigation Plan, namely those that relate to the effective operation and maintenance of radio-based early warning systems, and to the education and awareness of the population with regard to disaster preparedness and initial response; this includes upgrading and adding technology so that the system is capable of delivering timely and clear disaster warnings to the majority of the population of the RMI, on a 24 hour basis, and ensuring the people of the RMI have the knowledge, commitment and skills to undertake, whenever necessary, the critical disaster preparedness and prevention actions on the receipt of an early warning.

37. *Harmonizing and Strengthening Traditional and Modern Methods for Coastal Protection and Erosion Control* – proposed focus is on economically viable, socially acceptable and environmentally sound options that harmonize both traditional and modern methods of coastal protection and erosion control, on systems that reflect the differences in the location where they will be applied (e.g. remote outer islands; urban centers), and on systems that are replicable beyond the areas in which they will be demonstrated, allowing formulation of lessons learned, success factors and best practice guidelines for use elsewhere in the RMI.

### **Implications for Mainstreaming Environmental Management within the RMI**

38. It is recommended that actions be undertaken to implement the environmental road map and thereby address the eight priority areas. Mainstreaming will be facilitated by strengthening the enabling environment for environmental management and thereby enhance the effectiveness of efforts to integrate environmental considerations into existing and new development policies, plans and project implementation. The environmental sustainability development priorities as set out in the SDP should also be mainstreamed into the current strategic development plans of Government ministries and agencies.

39. Enhancing the enabling environment for environmental management can take place in many ways and at many levels, including: 1) recognizing in the performance-based budgeting the need to strengthen program/output definitions and performance standards to provide greater focus on core environmental and resource management functions, as well as strengthening performance monitoring and management and that sound environmental management is a profitable investment rather than an unproductive cost; 2) raising public awareness and improving consultation procedures in order to remove false perceptions, destroy current antagonism and antipathy, and build the mutual respect and confidence that unpins effective and sustained cooperation between stakeholders; 3) ensure that legislation and regulations are not providing perverse incentives that result in environmental degradation but are encouraging decision making and actions that result in good

environmental outcomes; 4) separating the policy and regulatory/compliance functions of environmental management in ways that avoid duplication but allow for effective coordination and cooperation; 5) undertake coordinated and continuing efforts to enhance the knowledge and skills of those in Government, the private sector and civil society who can contribute to improving the environmental outcomes of decision making and development policies and projects; 6) identifying and supporting environmental advocates, champions and other opinion leaders in the community who can play a key role in mainstreaming environmental management by highlighting the widespread and diverse benefits of improving and maintaining environmental quality and by documenting system and specific failures that lead to environmental degradation and unsustainable use of natural resources; and 7) increasing the use of information management systems to improve the quality and environmental outcomes of decision making, as well as in compliance and enforcement, including open access to information and the sharing of data bases and other information resources.

40. Greater certainty and quality in decision making, and in the application of laws and regulations related to environmental quality and conservation of natural resources, will result if the value of policy advice submitted to Government is improved and if decision makers show more commitment to heeding this advice rather than being influenced by other factors. Laws and regulations should be amended in ways that clarify the responsibilities, intentions, powers and procedures of Government.

41. The National Government has also made provision for the devolution of many environmental and resource management powers and services to Local Government, but few of the opportunities have been realized despite this being a very effective way to build public confidence and satisfaction. It is desirable to have increased involvement of Local Government in environmental and natural resource management, and in related activities such as land use planning, regulation of construction and other development activities, and delivery of services related to water supply and waste and wastewater management. But such devolution of responsibilities must be matched by provision of adequate resources and formal transfer of the powers to plan and manage for and, as a last resort, enforce the achievement of good environmental outcomes. There is a widely held opinion that the issues of land tenure and traditional land uses will preclude any effective land use planning and zoning. There is a need to build on and upscale the existing examples of success in harmonizing traditional and modern approaches to land use planning, to the management of the environment and natural resources, and to meeting other relevant needs of society.

## Abbreviations

ADB	-	Asian Development Bank
ADF	-	Asian Development Fund
AG	-	Attorney General
CEA	-	Country Environmental Analysis
CMI	-	College of Marshall Islands
CSP	-	Country Strategy and Program
CSPU	-	Country Strategy and Program Update
DMC	-	Developing Member Country
EEZ	-	Exclusive Economic Zone
EIA	-	Environmental Impact Assessment
EPA	-	Environmental Protection Authority
EPPSO	-	Economic Policy, Planning and Statistics Office
FEMA	-	Federal Emergency Management Agency
HF	-	High Frequency
KAJUR	-	Kwajelain Atoll Joint Utility Resources
JACA	-	Jaluit Atoll Conservation Area
JEMFAC	-	Joint Economic Management and Financial Accountability Committee
MALGOV	-	Majuro Atoll Local Government
MDG	-	Millennium Development Goal
MIMRA	-	Marshall Islands Marine Resources Authority
MIVA	-	Marshall Islands Visitors Authority
MUORA	-	Military Use and Operational Rights Agreement
NCSA	-	National Capacity Self Assessment
NGO	-	Non-governmental Organization
NPCC	-	National Policy Coordinating Committee
NTA	-	National Telecommunications Authority
OEPPC	-	Office of Environmental Planning and Policy Coordination
PARD	-	Pacific Department (ADB)
RMI	-	Republic of the Marshall Islands
SDP	-	Strategic Development Plan
SDMP	-	Standard Disaster Mitigation Plan
SSB	-	Single Side Band
SPREP	-	Secretariat for the Pacific Regional Environment Programme
TA	-	Technical Assistance
UNDP	-	United Nations Development Programme

## Note

In this report, "\$" refers to US dollars.

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Bar juon allen jen tumulol in buruom, kom kanoj in emol tata kin jipan im sapport ko ami rellap.

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## I. INTRODUCTION

1. The Asian Development Bank (ADB) uses the country environmental analysis (CEA) as the tool to assist with early incorporation of environmental considerations into the country strategy and program (CSP) of each of its Developing Member Countries (DMC). The CEA provides targeted information necessary for informed decision making to address, in an appropriate manner, environmental constraints, needs, and opportunities, including those that impinge upon poverty partnership agreements. The focus is on adding value to planned and ongoing development initiatives by reducing environmental constraints and taking advantage of environment-related opportunities.

2. Preparation of the CEA involves a participatory process at both country and ADB levels. This is initiated before the CSP, and continues through CSP preparation. The CEA is directed at the policy, program, and sector levels, but it also highlights issues and opportunities associated with environmentally sensitive projects in the pipeline.

3. The technical assistance (TA) to the Republic of Marshall Islands (RMI) to assist with preparation of this CEA had as its main objectives the mainstreaming of key environmental concerns into economic and development planning processes, and to contribute to the alleviation of poverty in the RMI. The TA to RMI is also designed to strengthen understanding among policymaking, economic planning, and environmental authorities about key environmental and natural resource management issues and their influence on achieving macroeconomic and national development goals.

4. This CEA for the RMI focuses on:

- the general environment status and trends in RMI, including the role of the environment and natural resources in the economy;
- key environmental constraints and opportunities;
- characterizing current climate-related risks and how these may change as a consequence of global warming (see Appendix 1);
- the policy, legislative, institutional, and budgetary frameworks for environmental management;
- the principal constraints on, and barriers to, improved environmental management;
- priority areas in policy, institutional and legislative mechanisms, as well as programs/projects that will help to mainstream environmental concerns into economic development planning; and
- identification of the main environmental opportunities associated with the CSP and its Update (CSPU), including recommending incorporation of environmental considerations in programs/projects in the pipeline as well as new priority actions and programs at the country level (TA and lending program).

5. **Methodology.** The findings and recommendations presented in this report are based on an in-depth participatory, consultative process, supported by a literature review and research (Figure 1). In April and May, 2005, ADB fielded a mission<sup>1</sup> to RMI during which meetings with some 60 stakeholders (individuals and

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<sup>1</sup> Mr. Edy Brotoisworo, Senior Environmental Specialist, Pacific Division (PARD) visited RMI from 7 to 11 April and from 26 April to 4 May. Prof. John E. Hay, Environmental Management Specialist, assisted by Ms Ellia Sablan-Zebedy, Domestic Consultant, visited RMI from 5 April to 12 May 2005. Prof. Hay's and Ms Sablan-Zebedy's consultancies were supported under ADB RETA TA: 6204-REG



groups) were conducted (see Appendices 2 and 3). These extensive in-country consultations also included organizing and hosting a one day National Dialogue<sup>2</sup>. Over 37 key stakeholders participated in the National Dialogue and provided valuable feedback on the preliminary CEA findings and recommendations. The participants represented a wide cross-section from various sectors, including National and Local Governments, NGOs, community groups, women's groups, academia, and the private sector. The consultations and National Dialogue helped to confirm the preliminary findings on key environmental and related issues, and facilitated a consensus on a proposed environmental road map, on priority areas for ADB interventions and on proposals for mainstreaming environment into the CSP for RMI.

6. A report on the National Dialogue is included as Appendix 4. Participants in the National Dialogue, and other interested parties, were afforded the opportunity to provide further comment on both the report on the National Dialogue and on a draft of the present report.

## **II. BACKGROUND INFORMATION AND SITUATION ANALYSIS**

### **A. Country Setting**

7. The Republic of the Marshall Islands is situated between 160 and 173 degrees east longitude and between 4 and 14 degrees north latitude. The country is approximately 3,680 kilometers southwest of Honolulu, Hawaii and 2,880 kilometers east of Guam. There are approximately 29 atolls and 5 islands, making a total land area of about 180 square kilometers. The more than 1,200 islands and islets that make up the RMI are located within an exclusive economic zone (EEZ) of about 2 million square kilometers.

8. The atolls are comprised of small low-lying coral caps set on domed volcanoes rising from the ocean floor. The chains, Western (*Ralik*) and Eastern (*Ratak*), lie about 200 kilometers apart and extend some 1,280 kilometers from the northwest to southeast. The highest elevation in the islands is only 10 meters above sea level, with an average elevation of 2 meters. The archipelago is home to the largest atoll in the world, Kwajalein. It has a total land area of 16 square kilometers, with about 90 islets surrounding a 1,700 square kilometer lagoon.

9. The climate is tropical with temperatures averaging about 27 degrees Celsius. There is little variation over the year. The southern atolls are characterized by lush vegetation. They receive about 4,000 mm of rainfall in a year, compared to the drier northern atolls that receive only 2,000 mm of rainfall per year.

10. The total population of the country at the time of the 1999 census was enumerated at 50,840. This was much lower than the RMI Government's previous estimates that placed the total population at around 63,000. The lower population is mainly attributed to many Marshallese migrating overseas, particularly to the United States, to seek employment. Appendix 5 provides additional information on the country setting.

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Mainstreaming Environmental Considerations in Economic and Development Planning Processes in Selected Pacific Developing Member Countries.

<sup>2</sup> The National Dialogue was held on 28 April, 2005.

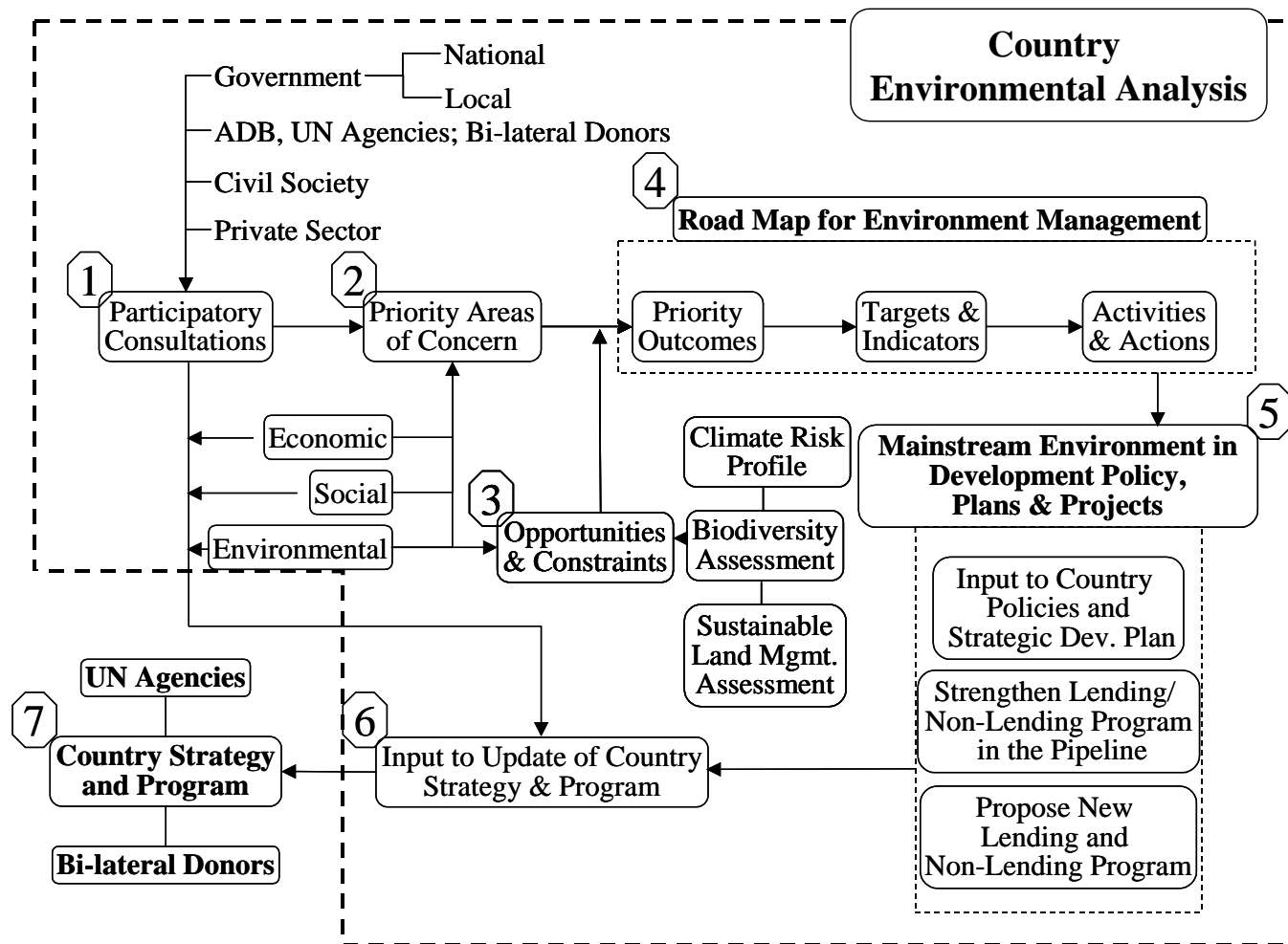


Figure 1. Process diagram for the country environmental analysis (CEA) in RMI.

## B. Role of Environment and Natural Resources in the Economy

11. RMI's natural resources underpin agriculture, fisheries and mining. As shown in Table 1, these have varying levels of importance in the national economy.

Table 1  
Significance of Environment and Natural Resources in the RMI Economy  
(Current Prices, \$ thousands)

Economic Sector	1997		1998		1999		2000		2001	
	GDP	percent	GDP	percent	GDP	percent	GDP	percent	GDP	percent
Agriculture	12,963.20	14.1	11,403.80	11.9	8,274.40	8.7	9,715.20	13.4	10,296.10	10.4
(a) Copra	1,915.40	2.1	1,636.60	1.7	1,578.50	1.7	2,186.00	2.2	1,638.20	1.7
(b) Food Crops	2,010.00	2.2	1,165.30	1.2	994.30	1	1,716.50	1.7	2,139.10	2.2
Livestocks	2,136.30	2.3	1,804.80	1.9	1,855.70	1.9	1,892.30	1.9	2,251.80	2.3
Agricultural services	175.20	0.2	163.00	0.2	165.90	0.2	166.70	0.17	208.70	0.2
Fishing	6,726.30	7.3	6,634.10	6.9	3,680.00	3.9	3,753.60	7.3	4,058.30	4.1
Mining/Quarrying	322.2	0.3	282.3	0.3	289.5	0.3	284.3	0.4	291.4	0.3
Hotels & Restaurants <sup>1</sup>	4535.0	4.9	4387.0	4.6	4456.0	4.7	4458.0	6.1	4421.0	4.5

<sup>1</sup> Category that most closely reflects the tourism sector

Source: Key Economic Statistics for the RMI.

12. **Agriculture and Food Crops.** Copra is the main cash crop. Oil from processed copra is the only agricultural product that is exported in significant quantities. Copra is produced mainly in the Outer Islands, and is the principal source of income for people living in the atolls. However, over the past 20 years the production of copra has declined dramatically. The decline in copra production is due to the continued depressed price of copra in world markets, reduced productivity of aging coconut palms, and inadequate storage and shipping services in the Outer Islands.

13. **Livestock.** In the RMI livestock activities comprise mainly subsistence farming of poultry and pork. The only livestock production that is considered of large-scale is operated by the Taiwan Agricultural Mission on Laura in Majuro Atoll. They raise a number of pigs and chickens in conjunction with the Ministry of Resources and Development and have also initiated a Farmers Association comprising 16 local farmers from Laura and about 30 local farmers scattered throughout the rest of Majuro Atoll. Most small farms include not only crops but also livestock, with the latter providing an additional source of income.

14. **Fisheries.** The fisheries sector is the most important economic sector in the RMI. The sector comprises of two sub-sectors, coastal and oceanic fisheries. Coastal fisheries, which are based on inshore and near-shore resources, are important for both subsistence and cash income for households. Total household seafood consumption averages about 1500-1700 tons a year. The estimated value of fish and shellfish, including crabs, harvested for people's own consumption, was about \$ 4 million in 1999 (ADB, 2001).

15. With over 2 million square km of ocean, RMI's EEZ supports a significant tuna resource with the value of the catch estimated at over \$50 million. In 2002-03 the economy based on the oceanic fishery experienced a downturn, with a decrease in the number of trans-shipments occurring in Majuro Atoll, and fewer fish were caught

in RMI waters. The downturn is attributed to the end of El Niño conditions, resulting in the principal tuna stock moving out of RMI waters and congregating more in the Western hemisphere around Papua New Guinea and its neighboring countries. This leads to decreased catch and less trans-shipments occurring in the RMI.

16. **Tourism.** The tourism industry in RMI is currently very small. The total number of visitors to the RMI arriving by air ranges between 4,000 and 6,000 per year, with an estimated spending of \$2 to 3 million. Tourists average less than 1,000 per year. People coming to RMI on business make up around 40% of arrivals. Tourism infrastructure (hotels, restaurants, dive shops etc) is found mostly on Majuro and Ebeye, with some facilities on other islands. RMI takes a niche marketing approach to developing tourism.

17. One objective of the RMI Visitors Authority (MIVA) is to develop popular awareness of, and support for, tourism development and environmental preservation, given the strong relationship between the two. MIVA has earned a reputation as a vocal advocate for increased tourism and environmental awareness. It works with members of the community and with Government agencies that support improved environmental management and sustainable development for the RMI.

18. **Mining and Quarrying.** The mining sector's contribution to national GDP has been a relatively constant 0.3 to 0.4 per cent, but in constant dollars the importance of the mining sector has been increasing. In 1991 the mining sector's value was \$192,600. By 1995 it had increased to \$285,200 and over the last five years for which data are available (Table 1) the value of the sector has averaged close to \$300,000. There is a continuing demand for sand and gravel aggregate, not only due to increases in the population in the urban centers of Majuro and Ebeye, but also due to other development projects.

## **C. Key Environmental Issues and Challenges**

### **1. Key Environmental and Sustainability Indicators**

19. **Environmental Indicators.** RMI's environmental indicators (Appendix 6) suggest that improvement in environmental quality and performance has been minimal. With growing population numbers and densities, especially in the urban centers, there is increasing pressure on the environment and natural resources. This is indicated in the increased number of contaminated water sources, particularly rainwater catchments, as homes are too close together. Other consequences are pollution of coastal areas and shorelines, and contamination of groundwater.

20. There is potential for improvement in RMI biodiversity conservation through establishment of protected areas. Currently there is only one formally established protected area: Jaluit Atoll lagoon, with an area of approximately 700 square kilometers. The Jaluit Atoll Conservation Area (JACA) was established in 1999 as a community-managed marine and terrestrial conservation area. The program has included traditional resource management systems as well as modern monitoring and rehabilitation programs. The Marshall Islands Marine Resources Authority (MIMRA) is currently working with Local Governments to develop and establish community-base management and protected areas in Arno, Likiep, Majuro and Mejetto.

21. **Sustainability Indicators.** The RMI is making slow but steady progress in meeting its Millennium Development Goals (MDG) (Appendix 6). Overall there has been improvement in achieving the goals emphasized by the RMI, for some more

than others. Notably for MDG Goals 2, 6 and 7, the RMI still has a long way to go in addressing core issues relating to education, health, sanitation and equitable access to goods and services in the Outer Islands. Contributing to this is absence of a poverty reduction and alleviation strategy that is mainstreamed into the policy and decision-making framework of the Government and affiliated agencies. As a result there are no specific national and local plans to focus Government efforts on poverty and hardship assessment and alleviation.

22. More effort is placed on economic development, but with little concomitant emphasis on social and environmental performance and good governance. The linkage between social, economic and political development initiatives is very weak in the RMI, with economic development plans almost always deliberated in isolation from social and environmental considerations. This, in large part, may explain why meeting the MDGs is uneven in the RMI, with some areas reflecting marked improvements, while little or no improvement is indicated in others (e.g. incidence of sexually transmitted diseases).

## **2. Overview of Key Environmental Concerns**

23. **Solid and Hazardous Waste.** In the past, solid waste was disposed of near homes, and left to decay on the ground. Back then, population density was low and most of the waste was biodegradable, presenting few ecological problems. Now, however, high birth rates and inward migration from the Outer Islands have contributed to high population densities in Majuro and Ebeye Atolls. This in turn has necessitated importation of basic foodstuffs that are usually canned, or packaged in other non-biodegradable materials. When combined with the mentality and habit of disposing of solid waste indiscriminately, this trend has led to households producing substantial quantities of both biodegradable and non-biodegradable solid waste. For instance, waste generation on Majuro atoll is about 0.5 kilograms/person/day (International Waters Project, 2005). About 50% of this is organic waste.

24. In addition to the general solid waste issue, there is also concern about the amounts of toxic or hazardous waste associated with the importation of vehicles, particularly in the urban centers, and also with such devices as high voltage transformers and batteries for electrical appliances.

25. Garbage dumps that also result in land reclamation have been developed to address the solid waste problem. Trash is collected weekly from 60 trash bins throughout Majuro and taken to the landfill where it is dumped, spread and compacted. The waste stream includes all putrifiable waste, including vegetative waste. However, to date, there is no screening of waste material prior to disposal, leading to indiscriminant dumping of hazardous wastes. Other shortcomings include insufficient surface cover material for landfills, lack of disease vector control, minimal gas control mechanisms and air monitoring, poor facility access and security, poor run-on/run-off control systems, and no record keeping.

26. The situation in the Outer Islands is no better, despite the smaller volumes of waste involved. For example, in Jaluit waste production per person and per household is thought to be about the same as for Majuro (Appendix 2). Solid waste is disposed of, unscreened, in an area separated from the lagoon by a sea wall (gabion basket). When the tide is exceptionally high (2 or 3 times a month), waste floats over the sea wall and into the lagoon.

27. To address the solid waste problem on Majuro, an inter-government agency task force (Solid Waste Task Force) comprising of Majuro Local Government

(MalGov), the Ministry of Public Works, MIMRA, MIVA, the Environmental Protection Agency (EPA), the Office of Environmental Planning and Policy Coordination (OEPPC) and the Chamber of Commerce, has been established, with responsibilities including developing policies and strategies to minimize waste production (including public education and recycling of aluminum cans, glass, tires and green waste), selection and design of new long-term landfills, coordination of tasks, and advising Cabinet on measures and mechanisms to reduce waste production. However, to date, the Solid Waste Task Force has not been effective in addressing the issues.

28. A barrier that has impeded improving the performance of landfills and of land reclamations is the lack of a formal system of land use planning and development of regulations. The Planning and Zoning Act 1987 mandates Local Governments to develop land use plans and zones and establish building codes. However, to date, there has been little progress, largely due to the complexity of the land tenure system in the RMI and the low capacity of Local Government to act on the mandate.

29. **Contamination of Ground- and Rain-water Supplies.** The structure and climate of the atolls has restricted the quantity and quality of fresh water supply in the RMI. The source of drinking water varies from area to area, but for the country as a whole around 70 per cent of homes use rainwater for drinking (RMI Statistical Yearbook, 2003). To address shortcomings in water supply, the National Government distributed more than 3,000 water catchments to residents in both the urban centers and the Outer Islands. In addition, there are plans to construct another water reservoir to improve the security of water supply in Majuro Atoll.

30. While the supply of water is being addressed, there is a major concern regarding the quality of drinking water. Tests covering both Majuro and the Outer Islands indicate high and, in some cases, increasing levels of contamination.

31. **Destruction of Coral Reefs.** A major concern for both Government and the general public is mining on the reef and lagoon shorelines, contributing to rapid erosion, especially in various parts of Majuro and Ebeye. Moreover, the sand and gravel aggregates in these areas are non-renewable and there is increasing awareness that the mining of these resources is at present unsustainable.

32. The destruction of coral reefs is more pronounced adjacent to the urban centers as there is an increasing demand for housing and infrastructure development. Although there are various activities that contribute to the destruction of coral, the three most destructive activities are dredging, channel blasting and boat anchoring. Primarily on Majuro and Ebeye, sand and gravel for construction is extracted by dredging from the lagoonal intertidal and nearshore zones. This has heavily impacted the adjacent reefs. For instance, with suction dredging, the displaced sand and sediments are carried by ocean currents and deposited on reefs, leading to coral death.

33. **Pollution of Coastal Waters.** Pollution of coastal waters is particularly serious near urban centers and other developed areas and is usually related to: (i) discharges from fishing and other vessels, (ii) leaching and/or run-off from landfills, grave sites, and pig and chicken pens. High levels of nutrients in the marine environment encourages invasive alien macroalgae to grow over coral colonies and block out sunlight. Corals rely, in part, upon nutrients derived through a symbiotic relationship with marine plankton (dinoflagellates) known as zooxanthellae.

34. Reduced sunlight could disrupt the photosynthetic process carried out by the zooxanthellae and result in the demise of the affected coral colony. Invasive macroalgae could potentially alter the benthos from a diverse coral community to a

monotypic environment. Monotypic environments support fewer species of macro-invertebrates and fish species, marine organisms that are important to the daily diets of RMI residents. Thus, normal subsistence harvesting activities may be significantly disrupted by invasive species. Alien species invasions are an important consideration for residents of outer atolls, since these communities rely upon marine organisms for subsistence purposes.

35. **Extremes and Trends in Sea Level.** Due to the low elevation of the atolls, and the concentration of development in the coastal areas of all islands, extreme high tides, storm surges and the gradual rise in sea level due to global climate change present a high risk to the RMI (Appendix 1). High sea levels contribute to coastal flooding and to greatly accelerated erosion. Extreme low sea levels impede navigation and expose reefs, stressing the reef ecosystem and possibly contributing to coral bleaching. To date, coral bleaching in the RMI has been limited to small coral communities in shallow water environments.

36. **Accelerated Coastal Erosion.** A recent study (SOPAC, 1997) of Majuro Atoll, but with implications for all of the RMI, reported that most of the ocean and lagoon coastlines are erosional. Shoreline retreat of 10 to 20 m has occurred in some places.

37. Coastal erosion is caused both by natural and human factors and activities. Factors that cause coastal erosion include: a) sea-level rise; b) dredging; c) channel blasting; d) inappropriate design of landfills; e) vegetation clearing; and f) land reclamation. Storm surges, high waves, sea-level rise, subsidence, and tsunamis are natural processes that contribute to overwash and erosion of coastal shorelines. Of great concern is the cumulative impact of extremely small scale beach and coast mining. Anecdotal evidence suggests that, on Majuro Atoll at least, nearly every land owner engages in this activity.

38. Without intact stable shorelines, the integrity of local infrastructure such as roads, airports, buildings, and residences may be threatened. Furthermore, significant amounts of salt water may infiltrate the groundwater and degrade drinking water sources, wetlands, and agriculture (e.g. taro patches). Shoreline processes can maintain the integrity of tropical islets and islands and are influenced by such factors as coastal hydrology, deposition, storm patterns, vegetation, and coral reefs.

39. Humans can play a positive role in preserving vegetation and coral reef communities to maintain intact shoreline processes. Intact native vegetation communities are ideal for stabilizing shorelines since native plants have evolved to survive in tropical environments, tolerating tropical heat, humidity, salt water, extreme sunlight, and storms. Native vegetation communities function as soil binders, maintaining coastal berms and forests. These communities are part of the dynamic coastal process, well adapted to conforming to shifting shorelines. Alternatively, seawalls are static, immobile objects that do not conform to the ebb and flow of shorelines. Sea walls may become undermined in light of shifting shorelines, and no longer function. Furthermore, seawalls and other similar construction activities often disrupt or displace native vegetation communities. Intact coral reef communities are also ideal for protecting shorelines. Coral reefs function as buffers, dispersing wave energy that would otherwise contribute to the erosion of coastal shorelines. However, coral reefs in Majuro atoll are susceptible to direct destruction and sedimentation from poorly designed dredging and filling practices. Also, alien species, such as invasive macro algae, may degrade reefs by growing over coral colonies and blocking sunlight. Other negative impacts that contribute to the degradation of coral reefs include pollution, anchor damage, and coral bleaching.

40. **Potential for Over-exploitation of Renewable and Non-renewable Resources.** There is a growing threat of overfishing of in-shore areas. To date there has been little assessment of the ability of coastal fisheries to support even the relatively small size of the current catch. Catches of fish and shellfish are believed to be declining in lagoons and inshore reefs. Reasons for this decline are known to include over-exploitation and the use of destructive fishing methods. Over-exploitation has resulted from a combination of increasing size, and the use of overly efficient, and sometimes destructive fishing methods. The use of modern materials such as monofilament nylon for gill nets, for example, has made fishing effort more effective. In some cases destructive fishing methods, including the use of explosives and chemicals such as bleaching agents and cyanide, have caused damage to the marine environment and the killing of many small fish and marine organisms. Other activities such as wharf and near-shore infrastructure development have affected marine habitats.

41. Off-shore, Yellowfin tuna is nearing full exploitation. If the fishing effort is maintained at the current rate the yellowfin tuna stock will be overfished. The bigeye tuna stock is, however, reported to be fully exploited and the current level of exploitation is therefore unsustainable. There should be no increase in the bigeye tuna fishing effort, with future catches of bigeye from the RMI's EEZ not exceeding recent catch levels (SPC National Fishery Status Report, 2004).

42. Removal of a large biomass of target fish stocks may have impacts beyond these stocks, including influencing the survival, recruitment and abundance of other species, some of which may also have a high fishery value (e.g. billfishes). Due to the poor state of knowledge, the impact of fishing on these species is uncertain. Other species also interact with fisheries. For example, turtles, seabirds and marine mammals are sometimes captured accidentally by longline and purse-seine operations. In some cases mortality of these species occurs. Although the impact of fishing activities on these species relative to other factors is unknown (e.g. destruction of modification of nesting beaches, indigenous hunting, removal of eggs from nests, trawling operations adjacent to nesting beaches), conservation advocates have given special attention to longline fisheries. Considerable effort is being expended in redesigning gear to reduce the capture of these species, especially in the longline fishery.

43. The EPA is concerned that continuing extraction of sand and gravel aggregate from the reef, beaches and nearshore areas of Majuro Lagoon is unsustainable and may be contributing to shoreline erosion. Where present dredging is close to the shoreline it will also hinder the future reclamation and development of those areas. Social pressures are mounting for the provision of additional land by reclamation of the nearshore lagoon, but this will require fill material to both restore the volume previously removed and raise the reclaimed area to a suitable level (SOPAC, 2004).

#### **D. Institutional, Policy, Legal and Budgetary Frameworks**

44. The following sections summarize the relevant frameworks. Additional information is provided in Appendix 7.

##### **1. Institutional Framework**

45. RMI is a republic governed under a constitution and in free association with the United States. The RMI entered into a Compact of Free Association with the United States as passed by the United States Congress in January 1986. The



Compact defines the relationship between two sovereign nations. Under the agreement, the RMI is responsible for operating under its own constitution and conducting its own foreign and domestic affairs. The U.S. is responsible for defense, security and financial assistance to the RMI.

46. Executive power is vested in a four-year term president. The president serves as both chief of state and head of Government. A presidential candidate must win at least a 51 percent of the vote to become president. The current president, Honorable Kessai H. Note, has served since January 14, 2000. The *Nitijela* is the Lower House and comprises a legislative body of 33 members. The Upper House is comprised of an advisory council of *Iroij* (tribal chiefs). The 12-member council of *Iroij* advises the *Nitijela* on any bill affecting customary law, traditions, or land ownership.

47. The RMI has four court systems forming the judicial system: the supreme court, a high court, traditional rights court and district/community courts.

48. Government (both National and Local) is the key player in the environment sector, setting policy, making and enforcing regulations and implementing development and other initiatives that interact with the environment in both beneficial and detrimental ways. Other important players at national level are the private sector and non-governmental organizations, especially the churches. Regional and international donors and other organizations also have important roles in the environment sector.

## **2. Policy Framework for Sustainable Development**

49. The principal policy instrument guiding sustainable development of the Marshall Islands for the next 15 years is the Strategic Development Plan (SDP) 2003-2018 or Vision 2018. The SDP was prepared in June 2001 and approved by the *Nitijela* in October 2001. It links ten major challenges the country has faced over the last 15 years with ten broad national goals and objectives aimed at fostering sustainable economic development. The SDP envisions that a review of the progress of the SDP be carried out after 5 years – the first review should therefore take place in 2007.

50. The national priorities set out in the SDP are an integrated set of policies in the areas of macroeconomic and human resources development, development of the productive sectors, Outer Islands development, science and technology and culture and traditions. These address key cross-sectoral issues, including the environment. In addition to the SDP, a set of Master Plans accompanied by Action Plans were to be developed. In order to facilitate their implementation a National Policy Coordination Committee (NPCC) was to be formed, with a mandate to integrate the development policies into national planning and budgeting and advise the Cabinet of its progress.

51. The SDP includes two key goals of the environmental sustainability policy, namely: a) developing a regulatory system that can be enforced with a high degree of compliance at all levels, in order to achieve the sustainable development of natural resources while protecting the environment from any adverse impacts; and b) strengthening the relevant institutions and improving the procedural mechanisms so as to be able to secure the optimum support from international and regional efforts in minimizing the adverse impact of climate change.

52. The goals set out under the environmental sustainability policy are also expressed in terms of the following objectives: a) to achieve maximum benefit from all global environmental conventions through active commitment and participation; b)

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; c) to enhance the level of awareness and commitment among all people in the community to contribute toward the minimization of environmental degradation; d) to achieve the highest degree of compliance with environmental laws and regulations; and e) to reinvigorate the culture and traditional environmental conservation practices in ways that help harmonize development with environmental sustainability. A series of key performance indicators were identified as ways to measure progress.

53. Unfortunately, the Master Plans and accompanying Action Plans were not developed, and the proposed NPCC was never established. Instead the National Planning Office was revitalized into the new EPPSO. EPPSO is currently mandated to monitor and evaluate the progress and development of the country. New priorities and action plans have been established, but the environmental sustainability development priorities as set out in the SDP have yet to be mainstreamed into the current strategic development plans of Government ministries and agencies.

54. Another instrument guiding the sustainable development of the country is the set of MDGs. In 2000, the RMI became party to the United Nations Millennium Declaration. In that declaration, developed and developing countries agreed to focus on major global development issues with significant emphasis on poverty reduction and improved targeting of donor aid to developing countries.

55. Until recently there had not been a formally appointed Government body tasked to monitor and report on the status of the MDGs. A National MDG Task Force has yet to be formally established. However, to begin developing a framework for MDG monitoring and reporting, in 2004 EPPSO formed a partnership with UNDP to establish a program office within that office. In addition to other UNDP duties, the UNDP Program Manager is tasked to provide assistance to EPPSO to monitor and report on the MDGs, and to provide technical support to the National MDG Task Force, upon its establishment.

### **3. Legal Framework**

56. At the national level, RMI has legislation related to environmental protection, coastal conservation, planning and zoning, management of marine resources, preservation of cultural and historic properties, protection of public health and safety and of endangered species. In most cases the legislation allows for Ministries to pass and enforce regulations, usually on approval of a representative authority or council. Thus the National Environmental Protection Act 1984 establishes the National EPA, which has responsibility to pass and enforce environmental impact assessment and other regulations. The Act also has provision for an Environmental Advisory Council, but this has yet to be established. Similarly, the Marine Resources Act 1997 establishes MIMRA and gives it powers to conserve, manage and sustainably develop all resources in RMI waters. MIMRA has the power to delegate this responsibility to each Local Government so they can manage and protect their own marine resources within their five mile zones.

57. In addition to EPA and MIMRA, other important environmental and resource management institutions have been established by legislation, including OEPPC and EPPSO.

58. In many cases legislation also gives a mandate to Local Government Councils to pass and enforce ordinances, once they have been approved by the

Minister of Internal Affairs. Proposed ordinances are submitted to the Minister of Internal Affairs who passes them on to the Attorney General's (AG) Office for final review. The AG's Office has the responsibility to ensure all Local Government ordinances are consistent with national legislation and regulations.

59. The RMI is also party to many international and regional environmental and resource management agreements, one of the latest being the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

#### 4. Budgetary Frameworks

60. **National.** The Government obtains its funding for the national budget from the following sources a) domestic revenues, b) Compact funding and grants, c) Donor grants (Taiwan, European Union, etc) and d) ADB loans. Table 2 summarizes the projected RMI budget for fiscal year 2003/04.

Table 2

Projected Government Revenues for Fiscal Year 2003/04, from All Sources

<b>Budget Source</b>	<b>Amount</b>	<b>Comments</b>
Domestic Revenues	\$32.5 million	Allocated by RMI w/ Nitijela Appropriation
Compact Grants	\$29.8 million	Allocated by RMI w/JEMFAC oversight
Compact: Trust Fund	\$7.0 million	Managed by Joint Trust Fund Committee until 2003
Kwajalein Payments	\$15.0 million	Distributed according to Land Use Agreement (LUA)
Kwajalein Impact – RMI	\$3.1 million	Allocated by RMI w/ JEMFAC oversight
Kwajalein Impact – KADA	\$1.9 million	Allocated by RMI/KADA w/ JEMFAC oversight
Federal Programs	\$9.0 million	Subject to Federal grants "common rule"
Donor Grants	\$10.0 million	Allocated by RMI w/ donors (ROC, UN, etc) oversight
ADB Loans	\$4.5 million	Subject to ADB loan conditions (for Outer Is. Transport. Infra. & Vocational Education Projects)
<b>TOTAL</b>	<b>\$112.8 million</b>	

Source: RMI Statistical Yearbook 2003

61. Since the signing of the Amended Compact of Free Association with the United States in 2003, the National Government has made institutional changes and adjustments in order not only to promote good governance and accountability within its institutions but also to comply with the Amended Compact Fiscal Procedures Agreement. The Finance Ministry has been the focus of these reforms. It has upgraded its financial management systems for all of its financial operations, and created EPPSO, a new advisory and planning agency.

62. At the beginning of each fiscal year EPPSO, in collaboration with the Ministry of Finance and the Office of Chief Secretary, develops a Medium Term Budget and

Investment Framework to assist the National Government in budget planning. The Framework is on a five-year rolling basis. Furthermore, it assists the Government to review past public spending, target current and next year spending to priority areas and to document future revenue and spending trends. This process has helped to eliminate short-term budgeting and ad hoc financial fixes that have mired the RMI's development in the past years.

63. In addition to the Framework, EPPSO and the Ministry of Finance is also assisting the various ministries in developing and implementing performance-base budgeting. Until 2002 Government ministries and statutory bodies/agencies had utilized the traditional line budgeting. The task involves identifying and developing clearer objectives, strategies, activities and measurable key indicators for ministries. This type of budgeting ensures close monitoring and evaluation of ministry/sectoral performance and progress, enhances the ability to assess results or outcomes achieved, and allows Government to identify and address areas that need improvement. To date the following ministries and agencies have implemented performance budgeting - the Ministry of Education, Ministry of Health, Ministry of Resources and Development, Ministry of Justice, Office of the Auditor General and the Environmental Protection Agency. These are the key sectors that receive current Compact funding. Results must be reported back to the Joint Economic Management and Financial Accountability Committee (JEMFAC), for reporting and accountability purposes.

64. **Compact.** Under the Compact of Free Association, the United States is responsible for RMI's defense and strategic integrity and, in return, has unlimited and exclusive access to RMI's waterways for military purposes. In the 15-year period ending in 2001, the RMI received a total of about \$1 billion (adjusted for inflation) from the United States.

65. Beginning 2001 until 2003, the National Government negotiated the new Compact agreement and by the end of 2003 the Amended Compact of Free Association with the United States was approved by both parties. The Compact's amended economic assistance package is a major change in that it involves: 1) financial assistance that is more than the former Compact's annual grant assistance, and without the injurious 5-year step-downs as experienced during the past Compact's term; 2) the continued application of various Federal programs and services; 3) a new term of 20 years versus the former 15 years with a new trust fund mechanism that will help provide budget stability in the post grant assistance era; and 5) a Compact grant-related fiscal management approach that aims towards accountability and achieving results.

66. The Environment Sector Grant under the Compact is intended to increase environmental protection; establish and maintain conservation areas that achieve sustainable use; support environmental infrastructure planning, design, construction and operation; and involve the citizens of the RMI in the process of conserving the nation's natural resources.

67. **Environment Sector.** In the past, EPA's entire core funding has come from the National General Fund and Grant funds. However, in light of the new Amended Compact agreement, and under certain circumstances, EPA's current funding sources also include those from the Amended Compact and Special Revenue. The Special Revenue derives from permit processing fees, water testing/laboratory fees and from fines on violations of regulations specific to EPA. Areas and programs within the EPA can also seek donor funding or resources for very specific activities and outcomes. In addition, funds for various specific projects are provided by

international donors or programs, through organizations such as the United Nations Development Program (UNDP) or the Secretariat for the Pacific Regional Environmental Program (SPREP).

68. In the budget planning for fiscal year 2005, EPA's entire core funding from the National General Fund was significantly reduced and replaced with money allocated from the Amended Compact. Total EPA funding decreased by \$356,261, from \$956,920 to \$600,569 (Table 3). Compact funding increased by \$4,720. General funds decreased by \$32,368 as no General funds were allocated to EPA for fiscal year 2005. Special Revenues increased by \$2,704 while Grant funding (from all donors) decreased by \$353,317. Additional funding under the Military Use and Operating Rights Agreement (MUORA) was secured for EPA operations, particularly for programs and projects on Ebeye, Kwajalein Atoll.

Table 3

EPA Budget for Fiscal Year 2005

Outcomes	Compact Base Grant	Fees (non appropriated)	Special Revenues	Grants	Total
Outcome 1: To increase effectiveness of environmental protection and other programs	\$326,375	\$22,000	\$55,588	\$103,635	\$507,598
Ebeye targeted funds (% total Outcome 1)	55% (\$178,900)	0%	0%	0%	35%
Outcome 2: To increase environmental education and awareness	\$78,345				\$93,061
Ebeye targeted funds (% total Outcome 2)	47% (\$37,176)	0%	0%	0%	47%
<b>TOTAL</b>	<b>\$404,720</b>	<b>\$22,000</b>	<b>\$70,304</b>	<b>\$103,635</b>	<b>\$600,659</b>

Source: EPA Annual Report

69. The OEPPC was established in September 2003. It is funded through the National General Fund and from Grant funds. It does not receive any funding from the Amended Compact. For fiscal year 2005 OEPPC was allocated \$70,000 from the General Fund for its recurrent budget. OEPPC secured additional funding of \$615,000 from grant sources, through the following projects: (i) National Capacity Self Assessment (NCSA) PDFB (\$200,000); (ii) Second National Communication to the UN Framework Convention on Climate Change (\$415,000); and (iii) Biosafety Add On (funding as yet unconfirmed). The following projects are pending for 2006: (i) ADMIRE (\$1,000); and (ii) Coastal Protection of WAM area.

##### 5. Nature, Coordination and Impact of External Assistance Related to the Environment

70. In the year ending September 30, 2003, the official international development assistance to the RMI totaled \$54.8 million. The Office International Development Assistance, Ministry of Finance, is responsible for coordination of this assistance. Appendix 8 provides information on the large number and considerable diversity of activities supported by this assistance. While there are many complementary initiatives, there is no evidence of redundant or conflicting assistance.

### **III. REVIEW OF COUNTRY STRATEGY AND PROGRAM (CSP) AND COUNTRY STRATEGY AND PROGRAM UPDATE (CSPU)**

71. RMI joined ADB in 1990. The CSP was last updated in 2004 and covers the period 2005-2006<sup>3</sup>. The update was guided by: (i) data on, and a strategic analyses of, development trends and issues; (ii) a review of progress with the existing country strategy; and (iii) consultations and participatory processes that culminated in the National Coordination Committee meeting held in Majuro on 29 March 2004.

#### **A. ADB's Strategic Priorities for RMI**

72. ADB's strategic priorities for the RMI are fully supportive of the Government's development priorities and strategies as described above and are consistent with the current ADB strategy for the Pacific<sup>4</sup>.

73. The specific strategic priorities for the RMI, as articulated in the CSPU, are: (i) enhanced public sector productivity, including improved access to basic social services; (ii) enhanced environment for private sector investment, job creation, and growth; and (iii) strengthened public sector governance.

74. At the 2004 National Coordination Committee, reflecting the results of extensive consultations and participatory processes, and in support of the formal poverty partnership between RMI and ADB, a decision was also made to focus on prioritizing the CSPU in support of future efforts to reduce poverty, including the means to establish indicators and monitor progress.

75. The CSPU also calls for a focus on greater community participation in development processes, to raise ownership and the demand for social and economic progress that is needed if the deeper, more systemic constraints to improved productivity are to be resolved. The CSPU gives the following order of priority of assistance: (i) a participatory review and reform of the civil service and rationalization of Government assets; this includes improving personnel management and raising the effective demand for, and improving the delivery of, essential social services; this will include a stronger focus on urban areas and (in part due to external agency funding of other social infrastructure) urgent attention to improving the management of urban waste disposal; (ii) engaging all relevant stakeholders in a longer-term process to ease, if not resolve, the barriers associated with land or other security, high transaction costs, and other administrative barriers to improving the environment for competitive, private sector development; and (iii) further improving governance, particularly participatory budgetary and fiscal formulation and management, as well as broad participatory economic, thematic, and sector policy formulation and management, including regular public expenditure reviews.

#### **B. Summary of Current ADB Operations for RMI**

76. Since RMI joined ADB in 1990 it has received 12 loans totaling \$78.1 million and 44 TAs totaling \$18.1 million. Two loans of \$15.5 million and five TAs of \$2.62 million were active as of mid 2005. Table 4 shows cumulative ADB lending and technical assistance as of as of 30 April, 2005. Almost all loan funds come from the Asian Development Fund (ADF).

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<sup>3</sup> ADB. 2004. Republic of Marshall Islands Country Strategy and Program Update (2005-2006).

<sup>4</sup> ADB. 2000. A Pacific Strategy for the New Millennium. Manila.

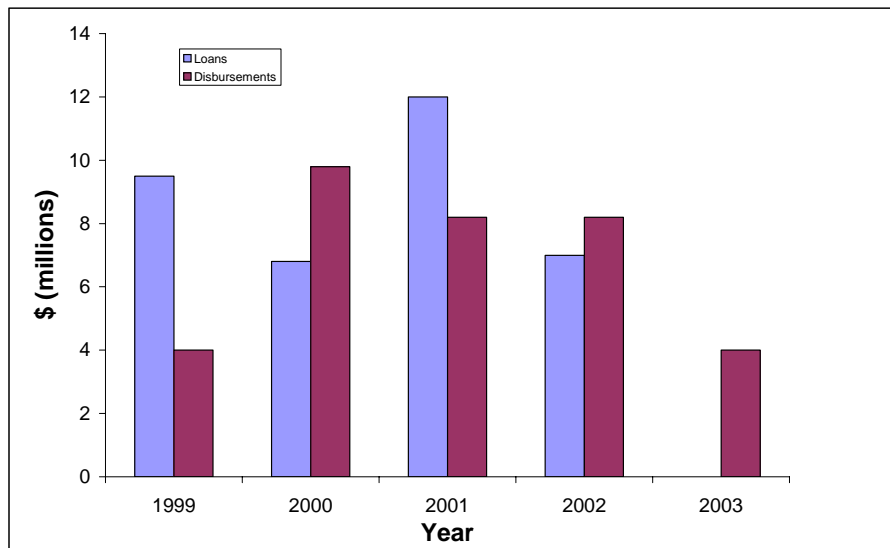
Table 4

Cumulative ADB Lending and Technical Assistance, by Sector

Sector	Number		\$ million		Per Cent	
	Loan	TA	Loan	TA	Loan	TA
Agriculture and Natural Resources	1	8	6.950	2.676	8.90	14.82
Education	2	3	14.825	.476	18.98	2.64
Energy		2		.400		2.22
Finance		2		.422		2.34
Health, Nutrition and Social Protection	1	6	5.700	1.405	7.30	7.78
Industry and Trade		3		.852		4.72
Legislation, Economic Management and Public Policy	3	16	24.000	10.136	30.72	56.13
Transport and Communication	1	3	7.000	1.190	8.96	6.59
Water Supply, Sanitation and Waste Water	2	2	9.900	.350	12.67	1.94
Multi Sector	2	1	9.750	.150	12.48	0.83
<b>TOTAL</b>	<b>12</b>	<b>46<sup>5</sup></b>	<b>78.125</b>	<b>18.057</b>	<b>100.00</b>	<b>100.00</b>

Source: ADB Database.

Figure 2 shows ADB lending and disbursements to the RMI for 1999 to 2004.



Source: ADB Database

Figure 2. ADB lending and disbursements to the RMI, 1999 to 2004 (\$million).

77. Table 5 classifies the cumulative loans and technical assistance in terms of the current three ADB strategic priorities. It is clear that while almost all the technical

<sup>5</sup> Two of these 46 TAs are supplementary TAs related to Tourism Development and Health Management Information System and Health Planning

assistance is directed towards addressing the strategic priorities, the loans are not as highly focused, as measured in terms of either the number or value of the loans.

Table 5

Cumulative ADB Lending and Technical Assistance, by Strategic Priority

Strategic Priority	Number		Value (\$ million)	
	Loan	TA	Loan	TA
Enhanced public sector productivity (access to basic social services)	4	10	16.150	3.375
Enhanced environment for private sector investment (job creation and growth)	2	12	14.900	3.892
Strengthened public sector governance	2	17	21.250	9.269
Others (those not falling in any of the above three priorities)	4	7	25.825	1.521
<b>TOTAL</b>	<b>12</b>	<b>46</b>	<b>78.125</b>	<b>18.057</b>

Source: ADB Database.

78. The 2005-2006 assistance pipeline for lending products includes two proposed loans: (i) Youth Social Services (total \$8.5 million with ADB funding \$6 million), and (ii) Urban Solid Waste Management (total \$10 million, with ADB funding \$7.5 million). Final ADB allocations will be determined under the revised performance based allocation policy.

79. Upcoming non-lending assistance will include project preparatory as well as advisory capacity-building TAs. The 2005-2006 assistance pipeline for non-lending products and Services includes: (i) Urban Solid Waste Disposal and Management, (ii) Developing the Civil Service and Rationalizing Government Assets, (iii) Preparation of Economic Report, Improving Sector and Thematic Policy and Institutional Development, (iv) Strengthening Sector and Thematic Policy and Institutional Development (EPPSO II).

80. Only one loan and one TA are related to environmental management, specifically solid waste disposal and management. The TA aims to help strengthen ownership and effective demand, primarily among the poor, for improved public services and for improved urban environment (solid waste disposal). This will complement a project preparatory TA in Solid Waste Management in 2006, with a possible loan in 2007.

### C. Assessment of Environmental Impacts of ADB's Assistance to RMI

81. Appendix 9 lists the environment-related technical assistance and loans provided to the RMI by the ADB since 1992. Only two TAs were specifically within the environment sector. However, the other TAs, and all loans, delivered environmental and related benefits indirectly, through such initiatives as water and wastewater infrastructure projects, and strengthening the tourism sector and fisheries management.

82. In Table 6 the environment-related TAs and loans are classified in terms of: (i) their pre-implementation environmental rating; (ii) environmental impacts during



implementation; and (iii) the sustained environmental and related impacts post implementation. Two important conclusions are immediately obvious. Firstly, there is excellent agreement between the anticipated and actual environmental impacts of project implementation. These are appropriately small and hence acceptable. It is contrary to ADB policy and RMI regulations for projects to have high environmental impacts during implementation. Importantly, this analysis ignores consequences for the global environment as a result of greenhouse gas emissions related to travel.

Table 6

Environmental Performance of  
Environment-related ADB Projects Implemented in the RMI

Project Name	Type	Environmental Category <sup>6</sup>	Environmental Impact	
			Due to Implementation	Sustained, Post Implementation <sup>7</sup>
Majuro Water Supply	TA/PP	C	C	1
Institutional Strengthening of the Environmental Protection Authority	TA	C	C	1
Preparation of a Health and Population Project	TA/PP	C	C	1
Institutional Strengthening of the Majuro Water and Sewer Company	TA	C	C	2
Strengthening Agricultural Support Services	TA	C	C	2
Outer Islands Electrification Feasibility Study	TA	C	C	1
Non Formal Environmental Education	TA	C	C	1
Health Management Information System and Health Planning	TA	C	C	0
National Fisheries Development Plan	TA	C	C	1
Ebeye Power Development Study	TA	C	C	0
Tourism Development	TA	C	C	2
Fisheries Management	TA	C	C	1
Community-Based Coastal Marine Resources	TA	C	C	1

<sup>6</sup> Available in advance only for loan projects; estimated retrospectively for TAs. Category A: Projects with judged to have significant adverse environmental impacts (potential or actual); Category B: Projects judged to have some adverse environmental impacts, but of lesser degree and/or significance than those for category A projects; Category C: Projects unlikely to have adverse environmental impacts.

<sup>7</sup> Environmental benefits post project implementation range between negative (Category -1) and substantially positive (Category 3).

Development				
Outer Islands Transport Infrastructure	TA/PP	C	C	1
Majuro Water System	Loan	N/A	C	1
Skills Training and Vocational Education	Loan	C	C	1
Fisheries Development	Loan	C	C	-1
Health and Population	Loan	C	C	2
Majuro Water Supply and Sanitation	Loan	C	B	3
Ebeye Health and Infrastructure	Loan	B	B	3
Outer Islands Transport Infrastructure <sup>8</sup>	Loan	B	(B)	(2)

Source: ADB loan documentation and present study.

83. Secondly, the sustained environmental and related impacts post implementation are overwhelmingly beneficial. Initiatives that enhance water and sanitation services in the urban centers are clearly going to generate significant environmental and related benefits, well in excess of the adverse environmental impacts during project implementation. But projects in the tourism and health sectors have also generated significant environmental benefits, albeit less directly.

84. The following section summarizes the lessons learned from these experiences.

#### **D. Lessons Learned from ADB Assistance**

85. Some environmental and related benefits have been somewhat fortuitous and hence frequently not sustainable. A case in point is the loan for fisheries development. Not only did the project benefit from ADB's economic reform program but also from the occurrence of the El Niño. Given its central Pacific location, the RMI experiences a dramatic rise in catches as a result of El Niño, with consequent increases in vessel activity in Majuro. A conducive business environment with competitive fuel prices, good provisions, and efficient exchange of crews make Majuro an attractive regional port. The shipping line PM&O offered competitive freight rates for the fish catches destined for the canneries in Pago-Pago and, as a spin-off business, established a fish plant in Majuro. Initially the plant created approximately 150 jobs, with 80% for women. However, a subsequent decline in the size and quality of the fish available for processing, at least in part related to the ending of the El Niño event, resulted in closure of the plant.

86. The mere presence of resources does not necessarily translate into viable opportunities, and the isolation of the Outer Islands is a formidable constraint to development. In Outer Island contexts, potentially viable projects, such as pearl and sea-weed culture, require a minimum scale in order to be able to cover the essential overhead costs associated with management, quality control, and marketing of the products. In one TA pilot project funding was limited to \$5,000. This fell short of the minimum scale required for project viability. In recent years many interventions have

<sup>8</sup> To be implemented; hence impacts are estimated.

placed high priority on community-based management of resources – most notably marine resources – as in many locations these show clear signs of degradation. Moreover, community perceptions of the abundance of particular resources can be overly inflated and inconsistent with the suitability or sustainability of that resource as a commercial product.

87. Fisheries development in the RMI was seen as a potential contributor toward meeting pressing social and economic needs. However, the projects have failed to achieve this at two levels. At the sector level, failure was due to invalid assumptions, inadequate management, and confused and at times, contradictory objectives. Projects have also failed at the planning level by not distinguishing the crucial link between sustainable, private sector-led development and sound macroeconomic and sector policies.

88. The expansion of the water supply and sanitation facilities for Majuro have helped improve the quality and delivery of water and have significantly improved the sanitation by removing environmental nuisances. However, in the opinion of some this came at a too high cost, and the use made is too inefficient and unsustainable.

89. Although the technical, financial, and institutional recommendations related to the management and operations of the Kwajalein Atoll Joint Utility Resources (KAJUR) were feasible and well explained, they had only limited impact as most recommendations to strengthen the utility were never put into practice. Even after three years KAJUR was unable to collect its bills and lacked the financial resources to undertake regular maintenance or to even buy fuel. However, all physical project components were completed. As a result, adequate power and water are available to serve the needs of the island. The sewerage system is in operation, though when the power shuts down sewage leaks into the streets. The hospital is fully functional. Significant environmental improvements were achieved, and the overcrowded island was made somewhat safer from fire hazards. But there are still issues to be resolved, as evident by the fire of March 31, 2005, when the water pressure at the fire hydrants was insufficient to fight the fire.

90. Health indicators and other development indicators in Ebeye have improved. The long-term objectives of increasing cleanliness, improving the quality of life and environment in Ebeye, and better provision of basic needs have already shown significant signs of progress.

91. Recent public sector reforms have increased the willingness of Government to accept situations that increase the political burden by raising costs in the short term, while the benefits will only be realized in the long term. However, in addition to political commitment, major accomplishments also require public support. A low level of administrative capability in the concerned Government agency can derail project implementation, meaning a project will take longer to implement than was anticipated. Future project preparation should address this important institutional issue. The following points also need to be taken into consideration for future similar project involving institutional strengthening and restructuring: (i) concentrate on core/major issues, not peripherals; (ii) provide more time when substantial changes in policy are needed; (iii) understand the culture of the country, especially the decision processes; (iv) Government bureaucracy has often little understanding of the fundamental economics of business; and (v) adopt a pragmatic approach.

92. Poor project design at entry and lax monitoring, coupled with Government's lack of policy and coordination, and the Executing Agency's lack of management capacity, have all contributed to the failure of projects. Targets set for projects are

sometimes overly ambitious, fail to take into account developments already under way, and allow insufficient time for implementation. Performance monitoring and the evaluation system will suffer from any failure to put in place a reliable system of data collection and information production. Excellent and appropriate communication skills are required in addition to sound professional capabilities.

#### **IV. IMPEDIMENTS TO MAINSTREAMING THE ENVIRONMENT**

93. As the preceding sections have shown, the RMI has in place a commendably comprehensive and appropriate array of policy, legal, institutional and budgetary frameworks for environmental management and sustainable development. However, despite some recent notable improvements in environmental performance, in many areas and respects practical reality falls far short of the potential the above frameworks allow and should facilitate. Many examples have already been given, but it is instructive to highlight a selection here.

94. Land use planning and zoning is effectively non-existent, meaning there is ad hoc and often conflicting use of land, with activities often conducted in areas where environmental impacts will be higher than might be the case in other locations. Severe limitations on the Government's access to land also lead to ad hoc and politically expedient placement of infrastructure. This often delays and increases the costs of provision of services such as water supply, and management of solid waste and waste water. The absence of effective controls on siting and construction of buildings has adverse consequences not only for the environment but also for human health, safety and wellbeing.

95. Similar problems arise due to the present ineffectiveness of the environmental impact assessment (EIA) regulations, with these extending to the current lack of effective control on dredging for construction aggregate and on earth moving. Littering is still widespread. Lack of secure access to potable water, in both the urban centers and Outer Islands, is reflected in the high incidence of waterborne illnesses. Some 25% of homes are still without adequate sanitation. Coastal erosion is widespread, on both developed and more natural coastlines and there is growing evidence of that both the coastal and offshore fisheries are being overexploited. These and other changes highlight the failure to arrest degradation of the environment and natural resources.

96. The ability for effective dissemination of early warnings has not improved, despite lessons to be learned from recent occurrences of natural disasters, in the RMI and further a field.

97. Why is there such a shortfall between the potential for sound environmental management, and the practical reality described above?

98. There are many reasons, most of which are interrelated, forming a complex web of causes and consequences. It is easy and obvious to highlight shortfalls in funding, land and human resources, but such comments are overly simplistic and largely unhelpful. The focus must be on the critical, systemic constraints and barriers. These often manifest as a failure of Government to make, and implement in a timely manner, decisions based on advice from officials that is designed to result in good environmental outcomes. Politically expedient decision making may lead to sound advice being ignored. Decisions may also be made in the absence of sound advice due to it not being sought, due to inadequate time, expertise, equipment and funding being available to acquire and analyze the required information and compile the advice, and often due to a lack of effective coordination of information between Government agencies. Informed decision making requires a comprehensive

knowledge base that is readily accessed by all stakeholders – Government, the public and the private sector. As in most small island developing countries, information is hard to obtain and there is little effective information sharing, even between Government agencies.

99. As an example of how improved access to information can facilitate planning and decision making, Appendix 1 provides the climate risk profile for the RMI. Climate-related hazards, such as accelerated coastal erosion, drought and typhoons, impede development in the RMI. Their detrimental effect on the economy, and on social and environmental systems, will increase as a consequence of global warming. But these adverse effects can be reduced, and opportunities exploited, if Government, the private sector and the wider public have access to quality information on current levels of risk and on how these risk levels will likely change in the future.

100. Another impediment to improved environmental performance is the substantial, and growing, shortfalls in respect and cooperation between Government and the people of the RMI. Even when the Government is trying to take an initiative that is intended to benefit the public at large, perceptions may be such that the initiative is effectively stalled. The following example illustrates this point. In 2003 the RMI *Nitijela* passed the Land Recording and Registration Act, and thereby created the Land Registration Authority. The Authority will record all land interests, registration of certain land interests, guarantee title to registered interests, and establish legal requirements for land leases in the RMI. Despite there being, amongst the public, widespread interest in and benefits from the recording and registration of land interests, to date only four parties have applied to have their land title registered. There is a widespread perception that registration may make it easier for the Government to acquire the land under provisions of the 1986 Land Acquisition Act. As a result, few parties have made use of the opportunities now provided by the Land Registration Authority. The cost of recording or registering land interests is also an impediment. In a society where un- or under-employment is high, and the cash economy remains small (especially in the Outer Islands), fees will often preclude the ability to access an otherwise desirable Government service.

101. Government, in some instances, contributes to misunderstandings. A case in point is a certain degree of confusion over ownership of land reclaimed from below the high water mark. On some occasions Government has granted title of such land to adjacent landowners, in return for their cooperation to allow the disposal of solid waste as part of the reclamation activities. Many members of the public have extrapolated these instances to a belief that the adjacent landowner has title to reclaimed land, regardless of who undertook the reclamation. Land reclamation is ongoing in the RMI, in part because the Government considers it to be a more desirable method than compulsory acquisition, in order to increase its limited land holdings. The Public Lands and Resources (Reclamation Amendment) Bill 2005 has been introduced to remove any doubt that the Government owns all land below the high water mark. The traditional rights of owners of land adjoining the sea and lagoons are preserved subject to the rights of the Government to reclaim or authorize the reclamation of land below the high water mark. The Bill also sets out the powers of the Government to reclaim such land or authorize people in the private sector to reclaim land in accordance with an EPA permit.

102. The good work of Government is often impeded in other areas where there are environmental and related implications. Aversion by landowners and leaseholders to cooperate with officials wishing to lease or access land, such as for the construction or servicing of infrastructure including utilities, impedes the ability of

Government to ensure timely, efficient and effective provision of services which are in the interest of the wider public and the environment. Lack of cooperation can often be traced back to land owners and leaseholders perceiving, rightly or wrongly, that officials are not respecting their rights by failing to advise, consult, and inform them as to the Government's intentions and reasons, and in regard to the benefits (and adverse consequences) for those with an interest in the land. Informed landowners and leaseholders are unlikely to withhold cooperation when they are made aware of the benefits that will accrue to the wider community, if not to themselves directly.

103. The Government has considerable powers to enforce the current legislation and regulations. But as noted above, it can likely achieve the same outcomes if it engages with the public in a more sensitive and timely manner, and with the intention of gaining informed consent and cooperation rather than enforcing powers. Enforcement should be used only as last resort. The private sector should also be encouraged, in a deliberate way, to adopt the same approach in its dealings with both Government and the public. All too often of late, developers in the private sector have made information available only to those parties in the Government, private sector and the community it considers will serve its interests. For example, currently there is no effective dialogue between those promoting foreign investment and the regulators of foreign investment activities. Besides being contrary to the EIA procedures, failure to achieve full exchange of relevant information is also contrary to the intent of those regulations and to best practice worldwide. The consequences for the developer are often severe delays and increased costs, if not total failure of the initiative due to a lack of popular support. The perception is that the EIA regulations are developer unfriendly. The fault lies not with the regulations themselves, but with the Government and the developers.

104. Finally, but by no means least, is the current reality of high levels of uncertainty in the implementation of policy and in the execution of laws and regulations. A case in point is the EIA regulations. At present there is considerable uncertainty as to when an EIA is required, how it should be prepared, and how it will be judged.

105. All the above examples and comments support the view that one of the key barriers to gaining improved environmental and related outcomes is the lack of awareness amongst the public, and to some extent the private sector, of the intentions and procedures of Government. Government is perceived to be autocratic, insensitive to traditional and customary rights and practices and uncommitted to good practices in raising awareness and consultation. The consequences often come in the form of a standoff between Government on the one hand and landowners and/or leaseholders on the other. Sometimes the public at large are antagonistic and uncooperative. A best practice approach to awareness raising and consultation, using where appropriate traditional methods which underpinned respect and cooperation in the past, would go a long way towards giving greater effect to the existing environmental and related policies, laws, regulations and financial expenditures made by Government.

106. It is important to note that the above findings are not new, though it is hoped that the reasoning and specific examples provided above give new meaning to the conclusions. For example, the CSPU 2005-2006 proposes that the country strategy for 2005 and beyond be refined to focus on greater community participation in development processes, to raise ownership and the demand for social and economic progress that is needed if the deeper, more systemic, constraints to improved productivity are to be resolved. It highlighted the need for an increased effort to reform the civil service by improving both personnel management and delivery of

essential social and other services such as management of urban waste. The CSPU also calls for the engaging of all relevant stakeholders in a longer-term process to ease the barriers associated with land or other security, high transaction costs, and other administrative barriers to improving the environment for competitive, private sector development. Other desirable improvements highlighted in the CSPU include strengthening governance and economic, thematic, and sector policy formulation and management.

## **V. PRIORITIES FOR ACTION**

### **A. Findings**

107. In developing the 'priority areas' for the RMI, three considerations were taken into account: 1) identifying environmental constraints on development; 2) identifying new opportunities where the environment and natural resources can provide for economic development and social progress; and 3) identifying strategies to alleviate poverty and hardship in the country. Eight 'priority areas' have been identified. Mainstreaming responses that address these priority areas will help ensure that the RMI will progress quickly in achieving sustainable development.

#### **Priority Area 1: Improving Outer Island transportation**

108. While there has been a significant effort on part of Government to improve transportation services to the Outer Islands, problems continue to persist in the transportation sector. Social and economic development, including the alleviation of poverty and hardship particularly in the Outer islands and the country as a whole, is very much dependent on this sector.

109. The Outer Islands economies are heavily reliant on payment for copra production, but this commodity is at an historic low world price. Collection and processing costs alone are barely matched by the market price. Statistical data reveals that the fall in copra production from 5,256 short tons in 2001 to 2,653 short tons in 2002 – the largest fall in copra production in years - was primarily due to non-lifting of copra from farmers in the Outer Islands. The marketing and selling of food crops, including marine products produced in the Outer Islands, are also dependent on this sector.

110. Currently, there is evidence of increased financial burden and hardship on families to earn income to sustain livelihoods. This has an impact on education as parents find it more difficult to pay for school tuition and such. This has also impacted people's health as reflected in the increased percentage of those afflicted with lifestyle diseases such as diabetes. Another consequence of not addressing issues in the transportation sector means more environmental constraints on natural resources, such as certain types of fish stocks and other marine species.

#### **Priority Area 2: Developing copra oil as an alternative to diesel fuel in the Outer Islands**

111. There is continued effort by both the Government and the private sector to develop copra oil as an alternative to diesel fuel. To date, however, little progress has been made. Although still in its experimental stage, Tobolar has been the only company in the country that has been producing and selling copra oil to a small number of individuals who operate diesel engines.

112. Since last year, the prices of diesel fuel and gasoline have increased – in the case of gasoline, from \$1.10 per gallon in 2000 to \$3.30 per gallon in 2005 on Majuro, and \$4.25 per gallon, or more, in the Outer Islands. For the Outer Islands the cost of diesel fuel has doubled, and in some cases tripled due to increased cost of freight. Currently Tobolar produces and sells copra oil at \$1.99 per gallon. However, if the production of copra oil took place in the Outer Islands, the cost of production would be much lower since copra need not be transported to Majuro. Labor costs would also be lower. The copra cake can be used as fertilizer and also, if of sufficient quality, for pig and chicken feed. The process waste can also be used as fuel for cooking and other fires, thereby reducing pressure on vegetation that is providing coastal protection and other benefits.

113. As already noted, there is chronic under utilization of copra. The potential to increase the production of copra oil means that the oil could also be utilized in generators, outboard motors and vehicles. Furthermore, the extraction of copra oil is seen to be of an appropriate scale since the cost of technology is not too significant. The spin-off from this industry means that there is potential for significant environmental, social and economic benefits as the oil also has other subsistence and commercial uses.

114. Since there are global environmental benefits associated with using coconut as a substitute for diesel fuel, there is an opportunity to seek funding from the Global Environment Facility.

115. The consequences of not pursuing this venture to its maximum potential will mean that the Outer Islands will continue to be deprived of employment opportunities, local development, and efficient use of the copra resource. Furthermore, this also increases the financial burden on communities in the Outer Islands.

### **Priority Area 3: Combining traditional and modern approaches to land tenure, and to land use, and environmental planning legislation**

116. The Government, with the assistance of ADB, has attempted to harmonize modern and traditional systems of land tenure and land use. Unfortunately, this has increased the perception that Government is attempting to take away control of land from traditional landowners. For instance, since the inception of the Land Registration Authority, only four parties have registered their land titles. Three of these four parties have taken their dispute to court.

117. In other areas, there is continued debate over development and other infrastructure projects, such as a proposed new dry dock, public schools, and dispensaries. Development of these facilities has in some cases stalled, and in other cases been severely delayed, due to the lack of clear demarcation of who controls the use of land. In the dry dock case, the Government has allowed a Tawainese private company to occupy a portion of land it had leased from traditional landowners for public use. Landowners are now demanding increased land lease payment due to the land being used by foreign investors. However, since the Government has a land lease agreement in place, it is reluctant to increase rental payments.

118. The management of land resources becomes more complicated as traditional landowners still retain considerable power in developing land under their jurisdiction. A case in point is exemplified in home loans in which potential home owners must secure approval from traditional landowners (Iroij, Alab and Dri-Jerbal) in order to construct homes on their land. The complexity of the land tenure system has



hindered Government led-initiatives to improve the urban environment. This is reflected, in part, by high population densities in these areas.

119. The consequences of inaction will include increases in social problems, degradation of the environment and natural resources, including contamination of groundwater and freshwater sources, leading to increases in water borne diseases and other health complications.

**Priority Area 4: Reducing risks to water quality and supply on Majuro, Ebeye and the Outer Islands**

120. Although security and quality of water supplies in both urban centers and outer islands is problematic, there has been some improved environmental performance in this area. For instance, there has been a significant increase in the number and frequency of water quality testing by the EPA. Furthermore, through its current budget, EPA attempts to further strengthen its water quality testing, awareness and training programs. To address the current limited capacity of storage in Majuro, the Majuro Water and Sanitation Corporation of the Marshalls Energy Company plans to construct a new water reservoir, thus increasing storage capacity by 30 million gallons.

121. Although there has been a significant increase in the number and frequency of water quality tests conducted over the years, evidence reveals that the number of contaminated water sources has also increased. In 1999, 204 out of 2,261 water sources were contaminated. In comparison, in 2003, 903 out of 3,633 water source tested were found to be contaminated. The increase in contaminated water sources is consistent with hospital statistics that indicate a high portion of the population suffers from gastroenteritis, diarrhea, amobiasis and other water borne diseases (Figure 3).

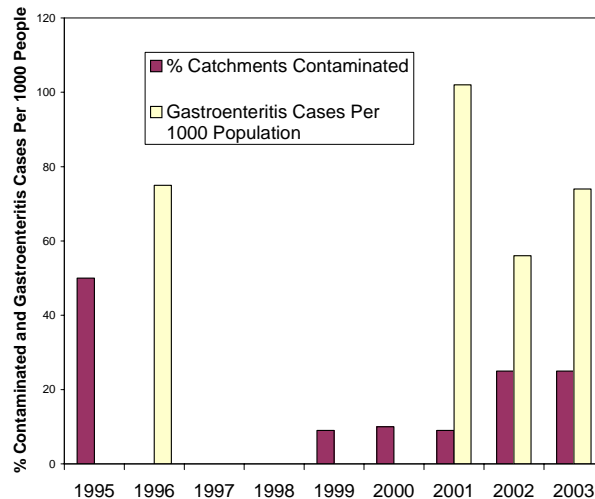


Figure 3. Percent of catchments tested found to be contaminated, and number of gastroenteritis cases per thousand people. (From RMI Statistical Yearbook, 2003)

122. In addition to strengthening EPA's water quality programs, the following issues also need to be addressed: incorporating and enforcing rainwater harvesting into building design; promotion of water efficient appliances; assessment, management and protection of the Laura groundwater lens; and promotion of large scale and household rainwater harvesting

123. The consequences of inaction include increased contamination of water sources, increased incidence of water-borne diseases, increased financial burden on Government (e.g. hospital costs), and less productive people.

**Priority Area 5: Disposing of solid waste in an environmentally sound manner, resulting in land reclamation**

124. The urban waste problem is severe as 70 per cent of RMI's population now resides on Ebeye and Majuro. Traditional use of waste for reclamation continues, but it has now been recognized that it is no longer acceptable and appropriate. Landfills are filling up quickly and continue to pose environmental and health risks to Majuro and Ebeye residents. For instance, the Jenrok study (International Waters Project, 2005) indicates that organic material comprised around 50% of the approximately 0.5 kilograms of waste generated by each person in a day

125. Various groups (NGOs, College of Marshall Islands (CMI) and National and Local Government agencies) are implementing a variety of solid waste management programs to combat solid waste issues. However, even though MalGov ensures that garbage bins are collected weekly, there has been continuous overflow of garbage onto the ground. There is a need to reduce the amount of waste going to landfill through reuse, recycling and other initiatives. In order to solve the solid waste issue in the RMI a joint top-down and bottom-up approach needs to be implemented.

126. Consequences of inaction include the continued pollution and degradation of shorelines and marine habitats, particularly those areas in proximity to landfills, contamination of groundwater, increased health problems, and impact on livelihoods of those people utilizing near-shore resources.

**Priority Area 6: Combining traditional and modern methods for coastal protection and erosion control**

127. The enforcement of environmental and other regulations has so far been ineffective in curbing inappropriate dredging, sandmining, and development of coastal zones, particularly in the urban centers. This is reflected in the increasing rate of coastal erosion, particularly in areas with little or no erosion control.

128. Other factors contributing to coastal erosion include the current design of landfills. This accelerates coastal erosion, as they tend to change wave patterns. All the landfills in Majuro and Ebeye have been designed with the purpose of minimizing construction cost which means there was minimal assessment of impact of designs on coastal and marine structure and ecosystems.

129. In the urban centers there are virtually no trees around shorelines to protect the land. Most trees are cut down for the purpose of easy access to reef flats, and for firewood. As a consequence, substantial amounts of land have been lost through coastal erosion. For instance, in Laura at Majuro Atoll, coastal retreat has been at least 3 meters.

130. The consequences of inaction include a growing population with less land area for development, contamination of groundwater due to intrusion of seawater, and increased tension between those who have an interest in the land.

#### Priority Area 7: Enhancing food security, especially in the Outer Islands

131. National Government initiatives and programs have been developed to enhance and improve food security, particularly in the Outer Islands. However, these efforts have proven to be insufficient. The increasing dependency on imported food, such as rice, flour, sugar and other low nutritious staple food stuffs, has led to the gradual decline in the production and replanting of local food crops and trees in the Outer Islands. On some atolls, for instance, existing varieties of atoll food, such as the *pandanus* and arrowroot, have disappeared through lack of cultivation.

132. The factors which have lead to increased consumption of imported food are: (i) long duration in the preparation of local food which in turn takes considerable valuable time away from income-generating activities such as copra and handicrafts production, and harvesting and preparation of fish and other marine products, (ii) low output yield of seasonal tree crops such as certain species of breadfruit and *pandanus* trees; (iii) poor soil conditions; and (iv) lack of seedlings and basic tools for planting.

133. A serious effect of the reduced use of atoll foods in favor of imported foods is the increased incidence of non-communicable diseases related to poor dietary habits and nutrition. For example, Figure 4 shows the number of outpatients presenting at Majuro Hospital with symptoms of diabetes, the second most common diagnosis at the hospital.

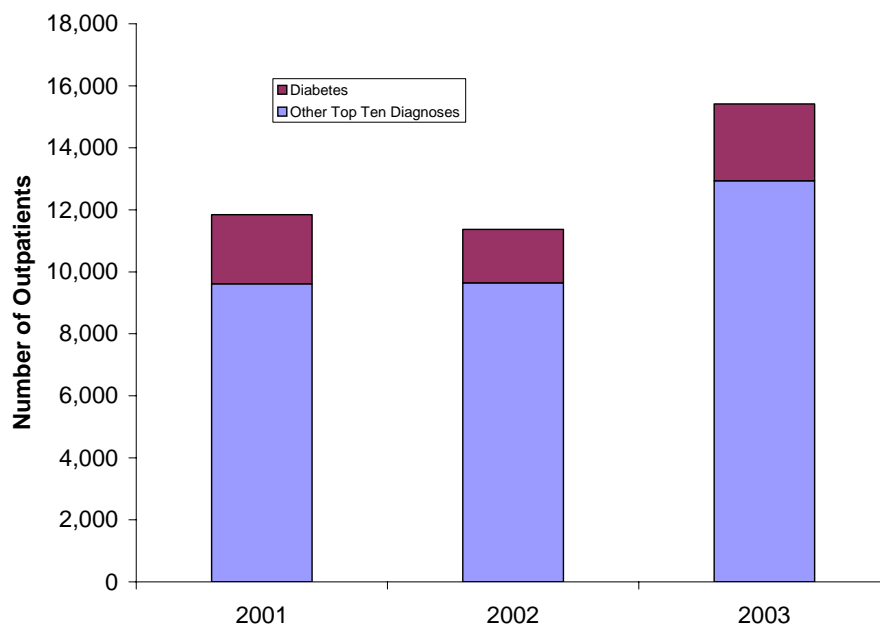


Figure 4. Number of outpatients presenting at Majuro Hospital with symptoms of diabetes, and total number of outpatients presenting with one of the top ten symptoms. (From RMI Statistical Yearbook, 2003)

134. For Outer Island communities, the need to generate income has become a matter of survival. For instance, cash income from the sale of copra and marine products is necessary in order to make payments for school tuition, electricity or solar power usage, fuel and other purchases such as clothing, cooking ware, fishing tools and other basic tools and equipment needed to clear the land and to construct homes. The need to make payments and purchases to sustain livelihood in the Outer Islands has become increasingly difficult for many Marshallese families.

135. The increased production of handicrafts due to the low copra price has led to the increased utilization of tree and plant crops and also marine products, especially seashells. This poses a risk to food security if people do not continue to re-plant and cultivate the land, and harvest from the coastal shorelines in an ecologically sustainable manner. The consequences of declining food security include loss of traditional subsistence activities and skills, and atolls more vulnerable to natural disasters, e.g. storm surges, typhoons, pest-disease outbreaks, and loss of food sources.

**Priority Area 8: Early warning systems for natural and other disasters (e.g. typhoons, tsunami, drought and disease)**

136. Currently communication with the Outer Islands is still based mainly on high-frequency (HF) radios, but the National Telecommunications Authority (NTA) is moving towards a mini-satellite system for communications in the atolls. Jaluit and Kili Atolls are the only atolls in the country utilizing this system at present, because they have a centralized power supply. Nationally it is evident that there is a lack of a systematic and country-wide early warning system for natural and other disasters. At present, the Government utilizes the national radio station to alert and warn people about impending natural disasters, but this system is not on air for much of the night. There have been few public awareness programs conducted to educate people on what to do during and after natural disasters. If early warning systems are adequate they can help minimize damage to the economy and the people.

137. A study conducted by the United States Army Civil Affairs in 2003 highlighted that exposure to the risk of future disasters is moderate in the Marshall Islands. However, while the threats (i.e. storm surges, tropical storms and typhoons, droughts, epidemics, and earthquakes) are moderately low, the country is very vulnerable to a disaster (see Table 7). The impact of a realized threat could be very high because of high population densities on some islands (e.g. Majuro and Ebeye), low elevation, wide dispersal of the atolls over a large area of ocean, and fragile island ecosystems on which the country is highly dependent for economic survival. At present, there are only two systems of single side band (SSB) radio for use by the Outer Islands: one is used for health clinics and the other for schools. Recently the Marshall Islands Conservation Society submitted to the Government of Japan a grant proposal for a Grassroots Human Security Project titled "Environmental Radio Network". The project will establish an outer island radio network for exchange of environmental information with and between nine outer islands. The aim is to operate the radio network to build grassroots awareness and positive-action solutions to environmental issues throughout the Marshall Islands and utilize the SSB radio network to support and build capacity for community based and outer island fisheries management. This proposed network has the potential to serve as the basis for a 24 h emergency radio network, if strengthened and enhanced to incorporate this capacity.

Table 7

## 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				M	H
Water	M	M		H	H
Agriculture		M	H	H	
Fishing					
Tourism	M	M			M

Source: United States Army Civil Affairs, 2003

138. The recently prepared RMI Standard Disaster Mitigation Plan (SDMP), as approved by both the RMI Government and by the US Federal Emergency Management Agency (FEMA), noted that the remoteness of island communities in the RMI, and the limited resources to deal effectively with a major disaster, exacerbates the vulnerability of the RMI and reinforces the need for effective risk reduction strategies such as zoning laws and building regulations to be developed and enforced (RMI Standard Disaster Mitigation Plan, 2005). Strengthening emergency communication and early warning systems is one of the ongoing mitigation measures identified in the SDMP. The SDMP notes that while there are communication and early warning systems in place in the RMI, they need to be more effectively maintained and end users of the systems need to be better trained in their application. The SDMP also identifies the need to provide basic information to all RMI citizens to help strengthen preparedness and community resilience through improved understanding of hazards and risks. The SDMP recognizes that the need should be addressed in a coordinated way that involves all sectors of society and calls for national and local disaster risk management training programs to support the improvement of national planning and disaster risk management practices.

### B. Road Map for Environmental Management

139. To facilitate the mainstreaming process, it is useful to present the eight priorities for action in the form of a road map for environmental management. Best practice in environmental road mapping involves the following sequential steps: (i) identify critical environmental concerns, needs and problem areas; (ii) determine the current state of relevant environmental components and systems; (iii) specify a timeframe within which improvements in environmental performance and quality are to be achieved (typically by between five and twenty years); (iv) develop goals and targets for environmental performance and quality, consistent with national policies, strategic plans and objectives; (v) identify actions and activities that are required to meet the specified targets; (vi) identify the implementers; (vii) identify and implement a system to changes in environmental performance and quality; (vi) review progress at pre-determined intervals; and (vii) feed back information from the review process into the implementation process. To the extent practicable, actions and strategies to promote improvement should be innovative, test new theories and alternative technologies, and promote breakthroughs for solving difficult problems.

140. Much of the information which would normally be compiled into the environmental road map has been presented in preceding sections of this report. Moreover, the EPA has already compiled what is in effect an environmental road map<sup>9</sup>, at least with reference to its areas of responsibility. But in the CEA the focus is on mainstreaming environmental considerations into national development planning and processes. A road map that operationalizes this process, and achieves this objective, is presented below. There are two important comments to make about the environmental road map presented here: (i) while consultation, education and awareness raising have been identified as areas requiring major attention if improvements in environmental performance and outcomes are to be achieved, these activities have not always been given separate attention in the issues, constraints and actions section of the road map – rather, their place in the road map is implicit; strengthening consultation, education and awareness raising will be infused into the work plans of the projects that are identified in the road map; and (ii) consistent with ADB’s practice of mainstreaming climate change in national development planning and processes<sup>10</sup>, climate variability and change have not been given separate attention – rather, addressing climate-related risks to the sustainability of projects and other development initiatives forms an integral part of the objectives and work plans of the projects that are identified in the road map.

141. The framework for action is enhancing the environment for development. Table 8 demonstrates how the eight priority areas described in the previous section and the actions in the environment road map are related within this framework.

Table 8

Relationship Between CEA Priority Areas and Actions Identified in the Road Map

CEA Priority Areas	Proposed Actions
<ul style="list-style-type: none"> <li>▪ Improving Outer Island transportation, to support small scale enterprises in agriculture and fisheries and improve education and health services</li> <li>▪ Developing copra fuel as an alternative to diesel in the Outer Islands</li> </ul>	Improve efficiency, effectiveness, environmental performance and sustainability of transport systems
<ul style="list-style-type: none"> <li>▪ Combining traditional and modern approaches to land tenure, and to land and environmental planning legislation;</li> <li>▪ Reducing risks to water quality and supply on Majuro and the Outer Islands</li> </ul>	Enhance water quality and access to a secure supply
<ul style="list-style-type: none"> <li>▪ Disposing of solid waste in an environmentally sound manner, resulting in land reclamation;</li> </ul>	Enhance environmental performance of solid waste management
<ul style="list-style-type: none"> <li>▪ Combining traditional and modern methods for coastal protection and erosion control;</li> </ul>	Enhance coastal protection and increase erosion control
<ul style="list-style-type: none"> <li>▪ Enhancing food security, especially in Outer Islands;</li> </ul>	Enhance food security, especially in Outer Islands
<ul style="list-style-type: none"> <li>▪ Early warning systems for natural and human disasters (e.g. tsunami, typhoon, drought, disease);</li> </ul>	Enhance early warning systems for natural and other disasters

142. Table 9 presents the road map for environmental management. It provides details on the timeframe, the current state of relevant environmental components, the targets and the actions. The road map does not describe the implementers or the monitoring and review procedures. These are detailed in the sections that follow.

<sup>9</sup> Environmental Protection Authority Strategic Plan 2004-2007, EPA, Majuro, 2004.

<sup>10</sup> Guidelines for Adaptation Mainstreaming in Pacific Department Operations, ADB, Manila, 2005.

Table 9

## Environmental Management Road Map

Sector Outcomes	Indicators/Targets					
	Current	Year 5	Year 10	Year 15	Year 20	Year 25
a. Greenhouse gas emissions (C equivalent of net fossil fuel imports, million tonnes)	0.036	0.032	0.029	0.025	0.021	0.018
b. % households with catchments or connection to public water supply	85	95	100	100	100	100
c. % households with adequate sanitation	75	90	95	100	100	100
d. Number of individuals trained in water quality testing	20	50	75	75	75	75
e. % water samples contaminated:						
Reticulated supply	18	0	0	0	0	0
Catchment	75	50	20	10	5	2
f. % marine water samples exceeding limit for specified class	40	10	0	0	0	0
g. Solid waste:						
To landfill (% total of managed waste)	95 (est)	60	45	40	35	30
Exported for reuse or recycling (% total of managed waste)	1 (est)	5	5	5	5	5
To composting (% total of managed waste)	4 (est)	35	50	55	60	65
h. % coastal survey sites vulnerable to erosion	100	70	50	25	10	5
i. % projects in compliance with EIA regulations, and % of approved projects monitored by EPA	0 0	100 100	100 100	100 100	100 100	100 100
j. Number people trained in EIA procedures, and % of development firms familiar with env. regs.	0 0	20 20	50 100	100 100	100 100	100 100
k. Domestic food production (thousands ton) and food imported (US\$ million)	6 11	8 9	10 7	12 6	14 6	16 6
l. Value of organic chemicals imported (US\$ thousand)	12	10	8	6	4	2
m. Value of fertilizer imported (US\$ thousand)	0.3	0.2	0.1	<0.1	<0.1	<0.1
n. Number of Local Government Councils with:						
Planning Commission and Planning Office	0	10	26	26	26	26
Ordinances requiring building permits consistent with RMI building code	0	10	26	26	26	26
o. Number of functional 24h emergency radio transceivers in Outer Islands	0 (est)	50	100	200	250	300
<b>Sector Issues, Constraints and Actions</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Improve efficiency, effectiveness, environmental performance and sustainability of transport systems						
Strengthen TA4004: Improving Delivery of Sea and Air Transport Services	If TA is reviewed and extended					

Strengthen Loan32208: Outer Island Transport Infrastructure Project	If loan is reviewed and extended			
Strengthen TA34210: Improving the Environment for Private Sector Development	If TA is reviewed and extended			
Strengthen TA4199: Strengthening the Economic Policy, Planning, and Statistics Office	If TA is reviewed and extended			
Enhance water quality and access to a secure supply				
Strengthen TA34210: Improving the Environment for Private Sector Development	If TA is reviewed and extended			
Strengthen TA4199: Strengthening the Economic Policy, Planning, and Statistics Office	If TA is reviewed and extended			
New TA: Building Capacity for Landuse Planning and Regulation of Building at Local Govt. Level				
Enhance environmental performance of solid waste management				
Strengthen TA34210: Improving the Environment for Private Sector Development	If TA is reviewed and extended			
Proposed TA: Increasing Ownership and Effective Demand for Improved Urban Waste Mgmt.				
Strengthen Proposed Loan: Urban Solid Waste Disposal				
Strengthen TA4199: Strengthening the Economic Policy, Planning, and Statistics Office	If TA is reviewed and extended			
Enhance coastal protection and increase erosion control				
New TA: Traditional and modern methods for coastal protection and erosion control				
Strengthen TA34210: Improving the Environment for Private Sector Development	If TA is reviewed and extended			
Strengthen TA4199: Strengthening the Economic Policy, Planning, and Statistics Office	If TA is reviewed and extended			
Enhance food security, especially in Outer Islands				
Strengthen Loan1791: Skills Training and Vocational Education	If loan is reviewed and extended			
Strengthen TA34210: Improving the Environment for Private Sector Development	If TA is reviewed and extended			
Strengthen Proposed Loan: Youth Social Services				
Strengthen TA38953: Increasing Ownership and Effective Demand for Education	If TA is reviewed and extended			
Strengthen PPTA: Outer Island Basic Social Services	If PPTATA is reviewed and extended			
Strengthen TA4199: Strengthening the Economic Policy, Planning, and Statistics Office	If TA is reviewed and extended			
Enhance early warning systems for natural and other disasters				
Strengthen Loan1791: Skills Training and Vocational Education	If TA is reviewed and extended			
Strengthen TA34210: Improving the Environment for Private Sector Development	If TA is reviewed and extended			
Strengthen Proposed Loan: Youth Social Services				
Strengthen TA38953: Increasing Ownership and Effective Demand for Education	If TA is reviewed and extended			
Strengthen PPTA: Outer Island Basic Social Services	If PPTA is reviewed and extended			
New TA: Enhancing Early Warning Systems for Natural and Other Disasters				
Strengthen TA4199: Strengthening the Economic Policy, Planning, and Statistics Office				



## **C. Implications for ADB's Intervention Programs**

143. Table 10 presents the results of a systematic analysis of the strengths, weaknesses, opportunities and threats (SWOT) in relation to addressing the eight priority action areas through a more explicit consideration of environmental opportunities and constraints in ADB's assistance to the RMI.

144. In total thirteen project interventions are proposed, in relation to six TAs (active or in pipeline), four loans (active or in pipeline) and three new TAs. The following two sections show how activities related to the eight priority areas can be integrated into the eleven project interventions, firstly for ten existing or planned projects, and subsequently for the three new TAs.

### **1. Mainstreaming Environment in Existing and Planned ADB Assistance**

145. Table 11 illustrates how, through mainstreaming environmental considerations into development planning and processes, activities related to the eight priority areas can be integrated into projects in the pipeline for ADB assistance to the RMI and also into ongoing projects. The opportunity to mainstream environmental considerations into the latter projects will arise only if and when projects are extended into a second phase.

### **2. Proposed New ADB Interventions, with Environment Mainstreamed**

146. Concepts for the following proposed new TAs are presented in Appendix 10:

- Developing Policies and Mechanisms, and Building Capacity, for Landuse Planning and Regulation of Building at Local Government Level;
- Harmonizing and Strengthening Traditional and Modern Methods for Coastal Protection and Erosion Control; and
- Enhancing Early Warning Systems for Natural and Other Disasters.

147. These TAs are proposed because there are few opportunities to realign and strengthen ongoing and programmed assistance in ways that would address the identified needs in the three environmental priority areas concerned – water quality and security, coastal erosion and vulnerability to natural and other disasters.

148. Landuse planning and building regulation are critical to ensuring effective responses to the documented need to improve access to secure supplies of water that meet drinking standards. Similarly, efforts to reduce and prevent coastal erosion and address coastal hazards are also dependent on being able to ensure that new development and current landuse practices avoid hazardous areas and also avoid exacerbating existing levels of hazard. The proposed assistance will also focus on harmonizing and optimizing the use of traditional and modern practices. This is best done by working at Local Government and community levels, with the role of National Government being to strengthen the enabling environment for the activities being undertaken at these levels. The proposed assistance related to early warning systems will address the residual hazards related to water security and coastal development, as well as hazards related to drought and outbreaks of infectious diseases.

149. In all three areas of proposed assistance the focus will be on building capacity, specifically by strengthening Local Government institutions and their technical capacity and through human resources development both within those same institutions and through education, training and community outreach programs.

Table 10

## SWOT Analysis of Mainstreaming Environment in Planned ADB Assistance to the RMI

Priority Area	Strengths	Weaknesses	Opportunities	Threats
<b>Food Security</b>	Reflects a high priority of Government and civil society; complements work of Government's Food & Nutrition Task Force; high potential for poverty and hardship alleviation; pilot programs already in place and showing success	Not consistent with ADB's current three strategic priorities for RMI; few opportunities to address issue through ongoing projects; most effective assistance would be via smaller projects at island and community levels	Possibility of focusing on strengthening the enabling environment for enhancing food security; major improvements possible by realigning projects in the pipeline; relevant indicators available to measure effectiveness of interventions;	Lack of effective coordination with other initiatives addressing food security issues; unwillingness of people to increase consumption of traditional foods and to devote time to growing and processing these foods; traditional crops & knowledge already lost
<b>Environmentally Sound Management of Solid Waste and Reclamation</b>	Areas of high concern to Government and the people; opportunities for major environmental benefits and improved quality of life; good understanding of issues and options, through previous studies	Issue is politically and culturally sensitive, with a long history of growing dissatisfaction and inaction; requires cooperation and sustained commitment at all levels (Government to community)	Projects (TA and loan) in the pipeline deal directly with the issue; others can also support the direct initiatives; co-financing available through Compact and other sources; NGOs and communities committed to making progress; Waste Management Task Force can provide direction and support	Waste reuse (e.g. composting) and composting unlikely to be economically self sustaining; need to resolve key issues related to land tenure etc; perception that the waste issue in the urban centers is irresolvable
<b>Enhance Outer Island Transport Systems</b>	Topic of high concern to Government and inhabitants of Outer Islands; effective public-private partnerships provide optimal solutions; good understanding of the issues and possible to measure changes in performance and outcomes	Previous attempts to involve private sector have failed; solutions will require ongoing Government investment as transport is more a social service than an economic operation; no strongly related projects in the ADB pipeline; missed opportunity with ongoing projects	Required assistance remains consistent with the ADB strategic priorities and long-term sustainable solutions will require effective public-private partnerships; ADB loan will improve infrastructure, laying the foundation for improvement in services	Current lack of clear and robust rules governing engagement of private sector; any change in Government policy regarding Outer Island development
<b>Water Quality/Security</b>	Past assistance has produced major & measurable benefits; clear understanding of the issues and options; assistance required is consistent with all three ADB	Requires major investment to develop policies and build capacity at Local Government level with respect to landuse planning and building regulation;	Government already has legislation in place that establishes landuse planning, zoning and building regulation; ADB assistance would generate	Inability to harmonize traditional and modern practices regarding land tenure etc.; diversity of priorities, needs and capacities at Local Government level; political

	strategic priorities for RMI; good enabling environment will ensure effectiveness of any interventions; focus of efforts with Compact funding, implemented by EPA	this will require new TA and subsequently a loan;	major environmental benefits and also alleviate poverty and hardship; key indicators make it possible to measure outcomes of assistance, relative to baseline	cost may be high in short term, with benefits coming in the longer term
<b>Coastal Protection</b>	Topic of high concern to Government and the people, given current and shoreline erosion rates, sea level extremes and rise, and the shortage of and value placed on land; many traditional coastal protection practices available for use, along with modern practices where necessary and appropriate; interest and capacity for involvement by NGOs, communities and other key players	Many current development practices exacerbate coastal erosion, requiring a major change in attitude and activities; problem is ongoing due to sea level rise, requiring continued commitment and effort; need effective and ongoing cooperation between all levels of Government, the private sector, and civil society; ongoing and programmed ADB assistance does not provide much opportunity to address this key issue of coastal protection	Initiatives will have synergies with assistance related to water quality and security of supply – landuse planning and building codes are key instruments for enhancing coastal protection; high priority for the strengthened EPA and EPPSO, so can build on Government initiatives; efforts will reduce poverty and hardship, both in urban centers and Outer Islands; new TA can focus on the relevant aspects of ADB's strategic priorities	Need for a new TA, at least, in order to focus ADB assistance on this priority area; inability to harmonize traditional and modern practices regarding land tenure etc.; diversity of priorities, needs and capacities at Local Government level; political cost may be high in short term, with most benefits coming in the longer term
<b>Early Warning Systems</b>	RMI is highly vulnerable to natural and other disasters; assistance from ADB would have major and widespread benefits, including environmental protection and alleviation of poverty and hardship; can build on initiatives already been taken by Government (e.g. new Disaster Management Plan) and NGOs (e.g. environmental radio network)	Effectiveness requires building capacity and raising awareness at all levels and in both urban centers and Outer Islands; tendency for assistance to focus on technology and planning, whereas building sustainable capacity and capabilities is required; many hazards need to be addressed, not just short duration natural hazards; requires new TA, at least, as current and programmed ADB assistance is insufficient to have substantial impact; early warning systems often upgraded post a disaster, rather than focus on preparedness	Many Government and other initiatives already being taken, but coordination is being undertaken by Disaster Management Office, guided by new Disaster Management Plan; new ADB TA can focus on the relevant aspects of ADB's strategic priorities, as well as add value to other ongoing and programmed assistance; will reduce RMI's dependence on ADB and other disaster relief assistance; opportunity to partner with other donors and exploit synergies	Difficult to maintain systems in operational mode over long periods with the need for warnings; tendency to focus on technologies and assistance that does not have sustained outcomes – need assistance that both raises and maintains awareness of actions to be taken in an emergency; new TA needs to be viewed in the wider context of ADB's assistance to RMI, rather than a standalone initiative; inadequate coordination by Disaster Management Office will negate many of the benefits of assistance by ADB and other donors

<b>Fuel Substitution</b>	Key strategy for reducing poverty and hardship in Outer Islands and improving environmental quality; appropriate technology for Outer Islands; key component of Government strategy for Outer Island development; private sector interested, and currently undertaking a pilot demonstration of the technology; NGOs and other players also highly supportive, including at practical levels; realignment of ADB assistance in the pipeline will greatly assist current and planned efforts of the private sector	Need to consider and address social issues, and gain active support and participation of Iroij and Alaps; coconut plantations will have to be improved if potential demand for copra is to be met; need to strengthen intra-island transport capability to bring copra to the press and return fuel to communities; surplus fuel must be produced, so sales can generate cash to pay Iroij and Alaps	Reduce reliance of RMI and Outer Islands on imported fossil fuels, producing global environmental benefits and national and Outer Island economic and social benefits; coconut oil can also be used for cooking and producing products for sale; quality of life for Outer Islanders will improve due to possibility of cheaper fuel for boats, generators and vehicles	Technology will place additional demands on the time and energy of Outer Islands, already struggling to subsist; need full cooperation of Iroij and Alaps, who must receive economic returns from their land and trees; technology must be at a scale and level of complexity suited to use in Outer Islands; trained operators required; need sale of surplus fuel to cover costs of maintenance and repairs
<b>Landuse Planning and Building Regulations</b>	Proposed assistance will build on, and add value to previous assistance provided by ADB (e.g. Mobilizing Land) and other donors; large economic, social and environmental benefits will result as current lack of landuse planning and building regulation is impeding development, fueling social tensions and stressing the environment; Local Government has the mandate and desire to engage in planning and building control, but lacks the capacity; success will reduce the vulnerability of the RMI to economic and environmental shocks	While the proposed assistance is consistent with ADB's strategies for RMI, ongoing and programmed projects do not address the needs that have been identified; thus new projects must be developed; valuable time will be lost, relative to realigning projects currently in the pipeline; while the enabling legislation for landuse planning, zoning and building regulation is in place, National Government has done little to ensure Local Government has the capacity to fulfill its mandate	The enabling legislation is in place, and is more than adequate to meet the demands for effective landuse planning, zoning and building regulation; the strengthened EPPSO and EPA are also working actively to ensure systems and instruments will be available to support the work of Local Governments; the public, including Iroij and Alaps, are showing increasing willingness to cooperate to bring about improved economic, social and environmental conditions	Perceived and real barriers to effective landuse planning, zoning and regulation of building are large; lack of transparency and accountability are impeding the cooperation that must underpin landuse planning and regulation of building; increased awareness of the plans and procedures of Government is a prerequisite to successful implementation; need to address the social implications and gain the full support of Iroij and Alaps; ADB technical assistance will likely identify capacity building requirements of such a scale that a loan will be necessary

Table 11

## Integration of Activities Related to the Eight Priority Areas into the Ten Existing or Planned Project Interventions

Project	Action Areas in the Environmental Sector					
	Transport	Water	Waste	Coastal	Food	EWS
TA4004: Improving Delivery of Sea and Air Transport Services	Assess feasibility of equipping intra-atoll and inshore fishing boats to run on copra fuel, and other options for reducing hardship	Assess capacity of sea and air transport systems to provide water and other essentials during and after a disaster, plus other options for reducing hardship	Assess options for improved management of waste from vessels and aircraft, as well as options waste reuse and recycling options that reduce hardship	Identify extent and remedial options for reducing impact of moving and anchored vessels on the coastal environment	Assess capacity of sea and air transport systems to provide food and other essentials during and after a disaster, as well as other options that reduce hardship	Assess capability of aircraft and vessels to convey warning to isolated communities in an emergency and to assist with disaster mitigation and recovery, as well as other options to reduce hardship
Loan32208: Outer Island Transport Infrastructure Project	Assess feasibility of providing each Outer Island with equipment for producing copra fuel; ensure infrastructure designs reflect climate-related risks	Determine preferred methods and infrastructure requirements for supplying potable water to ships	Determine preferred methods and infrastructure requirements for managing solid waste and wastewater from ships	Evaluate potential impacts of infrastructure on coastal erosion, and options for mitigation; assess risks to infrastructure from coastal hazards	Determine infrastructure and related requirements to enhance food security – e.g. ship board freezers and chillers	Determine requirements for transport infrastructure to meet requirements of early warning systems – e.g. stand-by generators
TA34210: Improving the Environment for Private Sector Development	Identify requirements for private sector to play greater role in enhancing the efficiency, effectiveness, environmental performance and sustainability of transport systems, and also reduce hardship	Assess opportunities and barriers for local production of catchments and other rotomoulding products that will make such systems more accessible to poor and other marginal groups	Assess barriers and opportunities for private sector to play a more active role in composting, recycling and landfilling, and in related initiatives that reduce hardship	Identify opportunities and barriers for private sector involvement in coastal protection and erosion control, including promotion and facilitating use of traditional methods and methods that reduce hardship	Evaluate opportunities for private sector to promote and engage in traditional and modern practices for enhancing food security and in other initiatives that reduce hardship	Identify and evaluate the opportunities and barriers to participation of the private sector in providing elements of an early warning system (e.g. emergency radio systems)

TA4199: Strengthening the Economic Policy, Planning, and Statistics Office	Identify and evaluate ways in which EPPSO might establish and monitor indicators of efficiency, effectiveness, environmental performance and sustainability of transport systems, in conjunction with MT&C	Identify and evaluate ways in which EPPSO might establish and monitor indicators of water quality and security, in conjunction with EPA; ensure water policy and planning reflects climate-related risks and address the needs of the poor	Identify and evaluate ways in which EPPSO might establish and monitor indicators of waste production, reuse, recycling and disposal, in conjunction with EPA; ensure waste management policies and plans reflect climate-related risks and address the needs of the poor	Identify and evaluate ways in which EPPSO might establish and monitor indicators of coastal retreat, in conjunction with EPA; ensure coastal management policies and plans reflect climate-related risks and address the needs of the poor	Identify and evaluate ways in which EPPSO might establish and monitor indicators of waste production, reuse, recycling and disposal, in conjunction with EPA; ensure food security policies and plans reflect climate-related risks and address the needs of the poor	Identify and evaluate ways in which EPPSO might establish and monitor indicators of disaster preparedness, impact and efficiency and effectiveness of recovery, in conjunction with the DMO; ensure disaster reduction policies and plans reflect climate-related risks and address the needs and capacities of the poor
Proposed TA: Increasing Ownership and Effective Demand for Improved Urban Waste Management	Assess opportunities and constraints to improving performance of the transport (including vessels and aircraft) with reference to waste generation and recycling	Consider opportunities and constraints for reducing impacts of solid waste and wastewater on water quality	Assess environmental outcomes for selected waste management options as well as ability to address climate-related risks	Assess options for environmentally sound land reclamation using solid waste, including design requirements to take into account climate-related risks and the needs and capacities of the poor	Assess ways in which enhancing food security can reduce production of waste and also contribute to reuse and recycling of waste (e.g. composting), including reflecting the needs and capacities of the poor	Consider ways in which early warnings of disasters are best incorporated in management plans for landfills and other waste management operations
Proposed Loan: Urban Solid Waste Disposal	Reflect above findings in design and operation of the solid waste disposal facilities	Reflect above findings in design and operation of the solid waste disposal facilities	Reflect above findings in design and operation of the solid waste disposal facilities	Reflect above findings in design and operation of the solid waste disposal facilities	Reflect above findings in design and operation of the solid waste disposal facilities	Reflect above findings in design and operation of the solid waste disposal facilities
Loan1791: Skills Training and Vocational Education	Ensure adequate numbers of individuals who can meet the environmental management requirements of the transport sector	Ensure adequate numbers of individuals who can meet the environmental management requirements of the water supply sector	Ensure adequate numbers of individuals who can meet the environmental management requirements of waste and wastewater management sector	Ensure adequate numbers of individuals who can meet the environmental management requirements of the coastal management sector	Ensure adequate numbers of individuals who can support efforts to enhance food security	Ensure adequate numbers of individuals who can install, maintain and repair early warning systems

Proposed Loan: Youth Social Services	Implement activities that will encourage youth to contribute to sound environmental practices in air and sea transport services	Implement activities that will encourage youth to contribute to sound environmental practices the water supply sector	Implement activities that will encourage youth to contribute to sound environmental practices in the waste and wastewater management sector	Implement activities that will encourage youth to contribute to sound environmental practices in the coastal management sector	Implement activities that will encourage youth to contribute to enhancing food security	Implement activities that will encourage youth to contribute to installing, maintaining, repairing and operating early warning systems
TA38953: Increasing Ownership and Effective Demand for Education	Identify and evaluate options that will ensure adequate numbers of individuals to meet the environmental management requirements of the transport sector	Identify and evaluate options that will ensure adequate numbers of individuals meet the environmental management requirements of the water supply sector	Identify and evaluate options that will ensure adequate numbers of individuals to meet the environmental management requirements of waste and wastewater management sector	Identify and evaluate options that will ensure adequate numbers of individuals to meet the environmental management requirements of the coastal management sector	Identify and evaluate options that will ensure adequate numbers of individuals who can support efforts to enhance food security	Identify and evaluate options that will ensure adequate numbers of individuals who can install, maintain and repair early warning systems
PPTA: Outer Island Basic Social Services	Identify and evaluate activities that will encourage communities to contribute to sound environmental practices in air and sea transport services	Identify and evaluate activities that will encourage communities to contribute to sound environmental practices the water supply sector	Identify and evaluate activities that will encourage communities to contribute to sound environmental practices in the waste and wastewater management sector	Identify and evaluate activities that will encourage communities to contribute to sound environmental practices in the coastal management sector	Identify and evaluate activities that will encourage communities to enhance food security	Identify and evaluate activities that will encourage communities to install maintain, repair and operate early warning systems

150. Details on the objectives, strategies and intended outcomes of these proposed technical assistance initiatives are provided in Appendix 13.

#### **D. Implications for Mainstreaming Environmental Management within the RMI**

151. In addition to taking initiatives to both implement the environmental road map and address the eight priority areas identified above, there are two key practical responses at national level that will help ensure effective mainstreaming of environmental management. These are creating and strengthening the enabling environment for environmental management and integrating environmental management into existing and new development policies, plans and project implementation. As noted earlier, the environmental sustainability development priorities as set out in the SDP have yet to be mainstreamed into the current strategic develop plans of Government ministries and agencies. With respect to enhancing the enabling environment for environmental management, several opportunities are worthy of attention.

152. **Performance-based Budgeting.** The recent implementation of performance-based budgeting has resulted in substantial improvements in environmental monitoring (quality and compliance) and helped to elevate the status of the environment sector within Government operations. However, the process of transferring the EPA to new revenue sources has resulted in an overall decrease in the operating budget for the agency, limiting its ability to maintain the progress already achieved. Sound environmental management should be seen as a profitable investment rather than an unproductive cost. Further improvements in the budgeting process are desirable, with the benefits extending well beyond enhanced environmental management. Improvements include strengthening program/output definitions and performance standards to provide greater focus on core functions, as well as strengthening performance monitoring and management. Another opportunity is better integration of the development budget and recurrent costs, in a multi-year framework.

153. **Participatory Planning.** There is a need for increased awareness of, and improved consultation with, the public, as well as the private sector. Improved environmental and related performance will result from a more committed effort to consult with stakeholders from the community and the private sector, using best practice methods. This will help remove false perceptions, destroy current antagonism and antipathy, and build the mutual respect and confidence that unpins effective and sustained cooperation between stakeholders.

154. **Progressive Legislation and Regulations.** Legislation and regulations should be reviewed to ensure that they are not providing perverse incentives that result in environmental degradation but are, on the contrary, encouraging decision making and actions that result in good environmental outcomes.

155. **Institutional Strengthening.** Currently there is considerable overlap and redundancy, but little effective coordination between three key Government institutions with environment and related responsibilities – EPA, OEPPC and EPPSO (see Appendix 7 for further details). EPA and OEPPC are both implementing environmental management projects. EPA policy is set by its Board so there is little opportunity for OEPPC to exercise its policy mandate. Moreover, some of these policy functions are now being implemented by EPPSO. While it is highly desirable indeed desirable to separate the policy and regulatory/compliance functions of environmental management, the way this has been undertaken in the RMI is far from ideal, presenting many opportunities for improvement.



156. **Upgrading Staff Knowledge and Skills.** As Government, the private sector, communities and individuals respond to the growing need for improved environmental management, and seize the opportunities, their initiatives will need to be supported by coordinated and continuing efforts to enhance the knowledge and skills of all the players. The capacity self assessment being conducted in the RMI, and recently completed with respect to conservation of biodiversity, will provide an excellent basis for planning and implementing programs to address such needs.

157. **Supporting Environmental Advocates and Champions.** Opinion leaders in the community can play a key role in mainstreaming environmental management. This can be achieved as much by highlighting the widespread and diverse benefits of improving and maintaining environmental quality as by documenting system and specific failures that lead to environmental degradation and unsustainable use of natural resources.

158. **Information Acquisition and Management Systems.** EPA is demonstrating how information management systems can be used to improve the quality and environmental outcomes of decision making, as well as in compliance and enforcement. This technical capability needs to be extended to other key players in environmental management, with open access to information and the sharing of data bases and other information resources.

159. **Integrated Approach.** Greater certainty and quality in decision making, and in the application of laws and regulations related to environmental quality and conservation of natural resources, will result if the value of policy advice submitted to Government is improved and if decision makers show more commitment to heeding this advice rather than being influenced by other factors. This requires a comprehensive knowledge base that is readily accessed by all stakeholders. Laws and regulations should be amended in ways that clarify the responsibilities, intentions, powers and procedures of Government. Such legislation can then serve as the basis for informing and thereby engaging constructively the public and members of the private sector. State of the art awareness raising programs will correct false perceptions, identify mutually beneficial opportunities, and build mutual respect and confidence.

160. Increased responsiveness and accountability of Government is already occurring as a result of the move to performance based budgeting, but this is only one of many tools that should be receiving greater attention. National Government has also made provision for the devolution of many environmental and resource management powers and services to Local Government. Few of the opportunities have been realized despite this being a very effective way to build public confidence and satisfaction. Given the highly dynamic nature of the RMI economy, environment and society an adaptive management approach<sup>11</sup> is to be preferred. This is best delivered closest to the intended beneficiaries, to the key assets being managed and to the source of resource inputs, including funding. Thus an argument is made for the increased involvement of Local Government in environmental and natural resource management, and in related activities such as land use planning, regulation of construction and other development activities, and delivery of services related to

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<sup>11</sup> Adaptive management treats management policies and actions as experiments, allowing continual improvement in the outcomes of management decisions as a result of learning from the success, or otherwise, of past management decisions. Adaptive management links credible science, values, and the experiences of stakeholders and managers, in order to improve the outcomes of management decision making.

water supply and waste and wastewater management. While devolution of many responsibilities to Local Government is to be encouraged, a concomitant requirement is the provision of adequate resources and formal transfer of the powers to plan and manage for and, as a last resort, enforce the achievement of good environmental outcomes.

161. As noted above, land use planning and zoning are effectively non-existent in the RMI. There is a widely held opinion that the issues of land tenure and traditional land uses will preclude any effective land use planning and zoning. However, Boxes 1 and 2 provide examples of success in harmonizing traditional and modern approaches to land use planning, to the management of the environment and natural resources, and to meeting other relevant needs of society.

162. Improvements in environmental performance will result from a strengthening of the enabling environment for sound environmental management and sustainable resource use. In many ways such initiatives are prerequisite to the specific interventions that will deliver more tangible improvements in environmental quality, health of natural resources and quality of human lives. Examples of interventions that can flourish once there is a strong enabling environment, and deliver the desired improvements, include: (i) small and indirect business enterprise programs related to such activities as inshore fishing, agriculture and food processing, handicrafts and ecotourism; (ii) improved radio and telecommunications to provide early warning of impending natural and other disasters; (iii) energy substitution in the Outer Islands, based on copra fuel; and (iv) improved security of potable water supply and management of solid waste and wastewater.

## **VI. CONCLUSIONS AND RECOMMENDATIONS**

163. This CEA for the RMI focused on the general environment status and trends in RMI, including the role of the environment and natural resources in the economy, the key environmental constraints and opportunities, the policy, legislative, institutional, and budgetary frameworks for environmental management, and principal constraints on, and barriers to, improved environmental management, priority areas in policy, institutional and legislative mechanisms, as well as programs/projects that will help to mainstream environmental concerns into economic development planning and identification of the main environmental opportunities associated with the CSP and its Update (CSPU). This includes recommending incorporation of environmental considerations in programs/projects in the pipeline as well as new priority actions and programs at the country level (TA and lending program). The aim was to proactively incorporate, integrate and support sound environmental management practices, not only in the economic development planning and policy-making for the RMI, but also in specific project-level interventions.

164. Participatory consultations, supported by research of relevant policy and technical documents, resulted in identification of seven key environmental concerns: solid and hazardous waste management, contamination of ground and rain-water supplies, destruction of coral reefs, pollution of coastal waters, extremes and trends in sea level, accelerated coastal erosion and a potential for over-exploitation or renewable and non-renewable resources. The influence of changing environmental quality on livelihoods, health, and vulnerability of poor and other minority groups was also explored, as was the environmental performance of key economic sectors.

165. Many opportunities for environmental and related improvements were identified as a result of both consultations and research. These would bring many benefits to the RMI economy as well as to society, especially the poor and other

marginal groups. However, a number of constraints on achieving these improvements were also recognized, but all would be resolvable with commitment and cooperation.

166. A review of ADB's current investment portfolio was also undertaken. Based on the preceding analysis and review, priority areas for action were identified and a road map for the environment sector was prepared. Consistent with the road map, specific recommendations were developed for mainstreaming the environment in projects in ADB's future investment program for the RMI.

167. Eight priority areas for development were identified. For each the ability of the planned ADB assistance was assessed, leading to a decision as to whether strengthening the currently planned assistance would be sufficient to making a meaningful contribution to addressing the eight priority areas. If so, the type of strengthening required was described. If the planned assistance was thought to be insufficient the essential elements of the additional assistance were described in concept briefs for the proposed projects.

168. The eight priority areas and the recommended changes to the ADB assistance pipeline are summarized in Table 12.

Table 12

Priority Areas for Mainstreaming Environment into National Development Planning Processes and Recommended Changes to the ADB Assistance Pipeline

Priority Area	Recommendations
Land use planning and building regulation at Local Government level – harmonization of traditional and modern practices	<ul style="list-style-type: none"> <li>▪ New non-lending technical assistance and subsequent loan               <ul style="list-style-type: none"> <li>○ Developing Policies and Procedures, and Enhancing Capacity, for Land Use Planning and Regulation of Building at Local Government Level</li> </ul> </li> <li>▪ Strengthen projects already in ADB project pipeline</li> </ul>
Early warning systems for natural and other disasters	<ul style="list-style-type: none"> <li>▪ New non-lending technical assistance and subsequent loan               <ul style="list-style-type: none"> <li>○ Enhancing Early Warning Systems for Natural and Other Disasters</li> </ul> </li> <li>▪ Strengthen projects already in ADB project pipeline</li> </ul>
Combine traditional and modern methods for coastal protection and erosion control	<ul style="list-style-type: none"> <li>▪ New non-lending technical assistance and subsequent loan               <ul style="list-style-type: none"> <li>○ Harmonizing and Strengthening Traditional and Modern Methods for Coastal Protection and Erosion Control</li> </ul> </li> <li>▪ Strengthen projects already in ADB project pipeline</li> </ul>
Disposing of solid waste in an environmentally sound manner, resulting in land reclamation	<ul style="list-style-type: none"> <li>▪ Strengthen projects already in ADB project pipeline, especially:               <ul style="list-style-type: none"> <li>○ PPTA: Increasing Ownership and Effective Demand for Improved Urban Waste Management and Disposal</li> <li>○ Loan: Urban Solid Waste Management</li> </ul> </li> </ul>
Enhance water quality and access to a secure supply	<ul style="list-style-type: none"> <li>▪ New non-lending technical assistance and subsequent loan               <ul style="list-style-type: none"> <li>○ Developing Policies and Procedures, and Enhancing Capacity, for Land Use Planning and Regulation of Building at Local Government Level</li> </ul> </li> <li>▪ Strengthen projects already in ADB project pipeline</li> </ul>
Enhance food security, especially in Outer Islands	<ul style="list-style-type: none"> <li>▪ Strengthen projects already in ADB project pipeline, especially:               <ul style="list-style-type: none"> <li>○ TA: Strengthening Sector and Thematic Policy and Institutional Development (EPPSO)</li> <li>○ TA: Increasing Ownership and Effective Demand for Improved Education Services</li> </ul> </li> </ul>
Improve efficiency, effectiveness, environmental performance and sustainability of transport systems	<ul style="list-style-type: none"> <li>▪ Strengthen projects already in ADB project pipeline, especially:               <ul style="list-style-type: none"> <li>○ TA: Further Enhancing the Environment for Private Sector Development</li> </ul> </li> </ul>
Substituting coconut oil as an alternative to diesel in the Outer Islands	<ul style="list-style-type: none"> <li>▪ Strengthen projects already in ADB project pipeline, especially:               <ul style="list-style-type: none"> <li>○ TA: Further Enhancing the Environment for Private Sector Development</li> <li>○ Loan: Youth Social Services</li> </ul> </li> </ul>

169. Summaries of the three proposed new technical assistance projects, to be included in the 2006-07 pipeline are as follows:

**170. Developing Policies and Procedures, and Enhancing Capacity Local Government Level for Land Use Planning and Regulation of Building and Other Development** - proposed focus is on identifying and implementing at Local Government level the strategies, approaches and mechanisms for land use planning, zoning and regulation of construction and other development activities, to achieve an appropriate and acceptable balance between delivering the desired economic, social and environmental outcomes and retaining traditional practices related to land tenure and use.

**171. Enhancing Early Warning Systems for Natural and Other Disasters** – proposed focus is on providing assistance for the implementation of two key components of RMI's new Disaster Mitigation Plan, namely those that relate to the effective operation and maintenance of radio-based early warning systems, and to the education and awareness of the population with regard to disaster preparedness and initial response; this includes upgrading and adding technology so that the system is capable of delivering timely and clear disaster warnings to the majority of the population of the RMI, on a 24 hour basis, and ensuring the people of the RMI have the knowledge, commitment and skills to undertake, whenever necessary, the critical disaster preparedness and prevention actions on the receipt of an early warning.

**172. Harmonizing and Strengthening Traditional and Modern Methods for Coastal Protection and Erosion Control** – proposed focus is on economically viable, socially acceptable and environmentally sound options that harmonize both traditional and modern methods of coastal protection and erosion control, on systems that reflect the differences in the location where they will be applied (e.g. remote outer islands; urban centers), and on systems that are replicable beyond the areas in which they will be demonstrated, allowing formulation of lessons learned, success factors and best practice guidelines for use elsewhere in the RMI.

173. At the national level it is recommended that actions be undertaken to implement the environmental road map and address the eight priority areas. There is also a need to strengthen the enabling environment for environmental management and integrating environmental management into existing and new development policies, plans and project implementation. The environmental sustainability development priorities as set out in the SDP have yet to be mainstreamed into the current strategic develop plans of Government ministries and agencies.

174. Enhancing the enabling environment for environmental management can take place in many ways and at many levels, including: 1) recognizing in the performance-based budgeting the need to strengthen program/output definitions and performance standards to provide greater focus on core environmental and resource management functions, as well as strengthening performance monitoring and management and that sound environmental management is a profitable investment rather than an unproductive cost; 2) raising public awareness and improving consultation procedures in order to remove false perceptions, destroy current antagonism and antipathy, and build the mutual respect and confidence that unpins effective and sustained cooperation between stakeholders; 3) ensure that legislation and regulations are not providing perverse incentives that result in environmental degradation but are encouraging decision making and actions that result in good environmental outcomes; 4) separating the policy and regulatory/compliance functions of environmental management in ways that avoid duplication but allow for

effective coordination and cooperation; 5) undertake coordinated and continuing efforts to enhance the knowledge and skills of those in Government, the private sector and civil society who can contribute to improving the environmental outcomes of decision making and development policies and projects; 6) identifying and supporting environmental advocates, champions and other opinion leaders in the community who can play a key role in mainstreaming environmental management by highlighting the widespread and diverse benefits of improving and maintaining environmental quality and by documenting system and specific failures that lead to environmental degradation and unsustainable use of natural resources; and 7) increasing the use of information management systems to improve the quality and environmental outcomes of decision making, as well as in compliance and enforcement, including open access to information and the sharing of data bases and other information resources.

175. Greater certainty and quality in decision making, and in the application of laws and regulations related to environmental quality and conservation of natural resources, will result if the value of policy advice submitted to Government is improved and if decision makers show more commitment to heeding this advice rather than being influenced by other factors. Laws and regulations should be amended in ways that clarify the responsibilities, intentions, powers and procedures of Government.

176. National Government has also made provision for the devolution of many environmental and resource management powers and services to Local Government, but few of the opportunities have been realized despite this being a very effective way to build public confidence and satisfaction. It is desirable to have increased involvement of Local Government in environmental and natural resource management, and in related activities such as land use planning, regulation of construction and other development activities, and delivery of services related to water supply and waste and wastewater management. But such devolution of responsibilities must be matched by provision of adequate resources and formal transfer of the powers to plan and manage for and, as a last resort, enforce the achievement of good environmental outcomes.

177. There is a widely held opinion that the issues of land tenure and traditional land uses will preclude any effective land use planning and zoning. There is a need to build on and upscale the existing examples of success in harmonizing traditional and modern approaches to land use planning, to the management of the environment and natural resources, and to meeting other relevant needs of society.

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## Appendix 1

### Climate Risk Profile for the Marshall Islands

#### Summary

The likelihood (i.e. probability) components of climate-related risks in the Republic of the Marshall Islands (RMI) are evaluated, for both present day and future conditions. Changes over time reflect the influence of global warming.

The risks evaluated are extreme rainfall events (both hourly and daily), drought, high sea levels, extreme winds and extreme high air temperatures.

Projections of future climate-related risk are based on the output of global climate models, for given emission scenarios and model sensitivity.

All the likelihood components of climate-related risk show marked increases as a result of global warming.

#### Introduction

Formally, risk is the product of the likelihood (i.e. probability) of an event or happening, normally referred to as a “hazard”, and the consequence of that hazard.

While the consequence component of a climate-related risk will be site or sector specific, in general the likelihood component of a climate-related risk will be applicable over a larger geographical area, and to many sectors. This is due to the spatial scale and pervasive nature of weather and climate. Thus the likelihood of, say, an extreme climate event or anomaly, is often evaluated for a country, state, small island or similar geographical unit. While the likelihood may well vary within a given unit, there is often insufficient information to assess this spatial variability, or the variations are judged to be of low practical significance.

This climate risk profile is based on observed data for Majuro Weather Service Office Airport (Latitude 7:05 N; Longitude 171:23 E; Elevation 10 feet<sup>1</sup>). In most cases the period of record runs from 1954 to 2004, inclusive. While data for Majuro cannot characterize the climate conditions for the entire country<sup>2</sup>, they do provide a general indication of current climate risks for the RMI. Future changes in climate are based on the output of global climate models and are for a grid square covering the majority of the country. The climate projections are therefore more reflective of changes for the country as a whole, rather than just Majuro.

The following hazards are considered to be among the potential sources of climate-related risk:

- extreme rainfall events;
- drought;
- high sea levels;
- extreme winds; and
- extreme high air temperature.

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<sup>1</sup> Units used in this Climate Risk Profile are those in common use in the Republic of Marshall Islands.

<sup>2</sup> The Republic of the Marshall Islands is situated between 160 and 173 degrees east longitude and between 4 and 14 degrees north latitude.

## Methods

Preparation of a climate risk profile for a given geographical unit involves an evaluation of current likelihoods of all relevant climate-related risks, based on observed and other pertinent data.

Climate change scenarios are used to develop projections of how the likelihoods might change in the future. For rainfall and temperature projections the Hadley Centre (United Kingdom) global climate model (GCM) was used as it gave results intermediate between those provided by three other GCMs, namely those developed by the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), Japan's National Institute for Environmental Science (NIES) and the Canadian Climate Centre (CCC). For drought and sea level the Canadian GCM was used to develop projections, while the method described in ADB (2005) was used to estimate the impact of global warming on maximum wind speed.

The SRES A1B greenhouse gas emission scenario was used when preparing rainfall, temperature and sea level projections. Figure 1.1 shows that this scenario is close to the middle of the envelope of projected emissions and greenhouse gas concentrations.

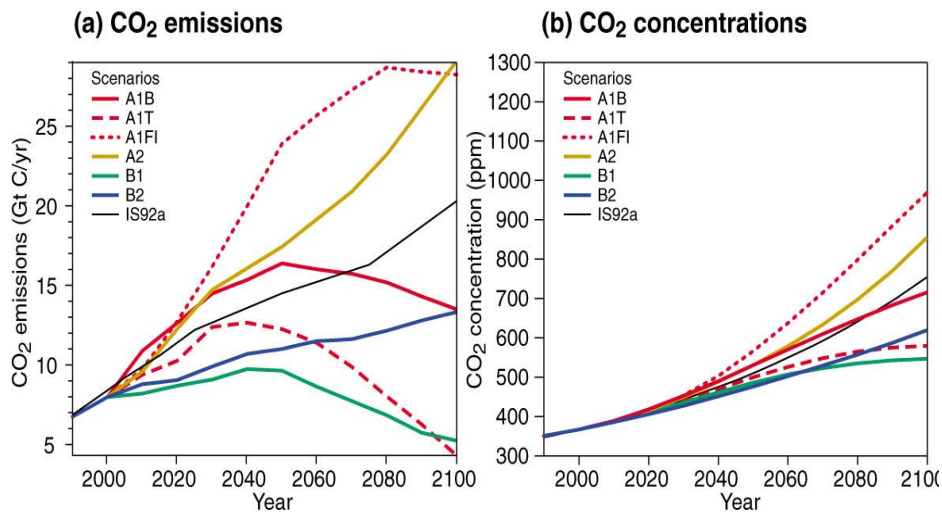


Figure 1.1: Scenarios of CO<sub>2</sub> gas emissions and consequential atmospheric concentrations of CO<sub>2</sub> (from IPCC, 2001).

## Data Specifications and Terminology

Data are presented in Imperial units since these are in common use in the RMI.

The *return period* (sometimes referred to as the *recurrence interval*) is used as a measure of the likelihood of an extreme event. The *return period* is a statistical estimate of how often an extreme event of a given magnitude is likely to be equalled or exceeded. Thus the "hundred-year event" is one which will, on average, be equalled or exceeded once in any hundred-year period. It does not mean that that the event occurs every hundred years. In fact, in every year there is a 1 percent chance that an event with a 100 year return period will occur.

## Uncertainties

There are numerous sources of uncertainty in projections of the likelihood components of climate-related risks. These include uncertainties in greenhouse gas emissions and in modelling the complex interactions and responses of the atmospheric and ocean systems. Policy and decision makers need to be cognizant of uncertainties in projections of the likelihood components of extreme events.

## Extreme Rainfall Events

### A. Daily Rainfall

Figure 1.2 shows the maximum daily rainfall, by year, for Majuro. A daily total of at least seven inches (in) is a relatively rare event, with a return period (i.e. recurrence interval) of five to six years (yr) (Table 1.1).

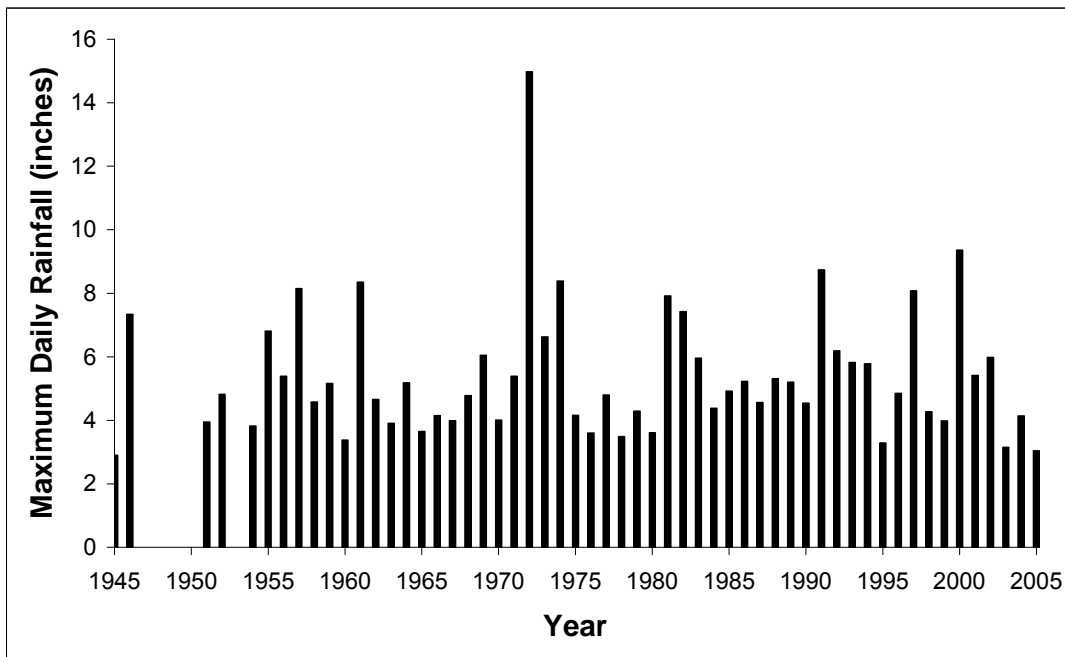


Figure 1.2: Maximum daily rainfall, by year, for Majuro. Data for 1945 to March, 2005. Missing data for 1947-1950 and for 1953.

The relationship between daily rainfall amount and return period for Majuro is shown in Figure 1.3.

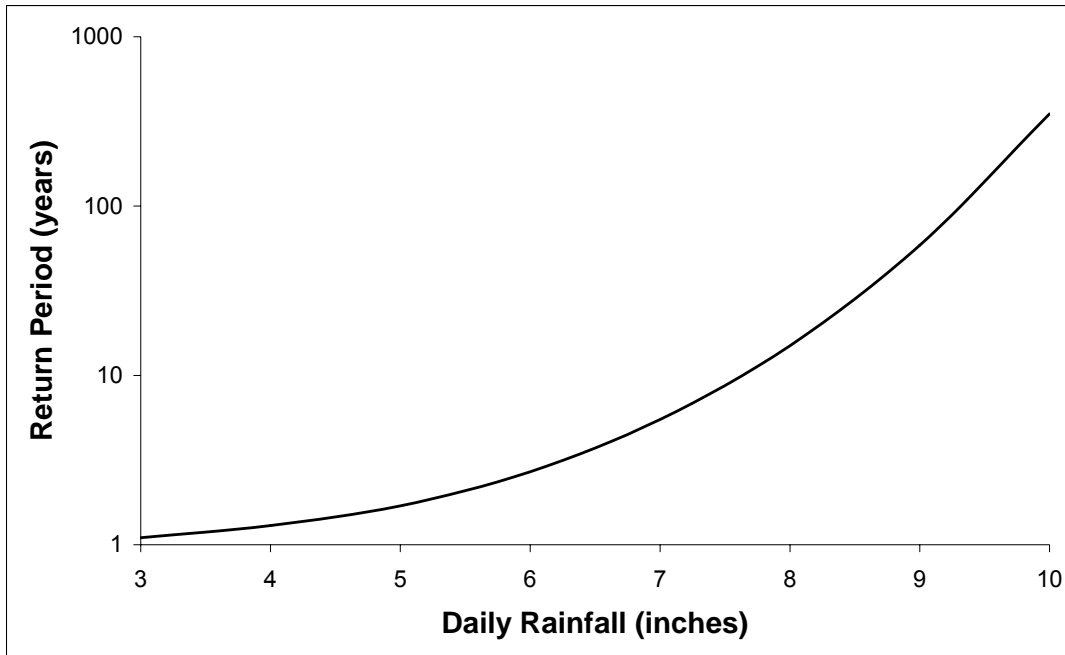


Figure 1.3: Relationship between daily rainfall and return period for Majuro, based on observed daily rainfall for 1945 to March, 2005. Missing data for 1947-1950 and for 1953.

As shown in Table 1.1 and Figure 1.4, global warming will significantly alter the likelihood, and hence return periods, of extreme rainfall events.

Table 1.1

Return Periods (yr), for Daily Rainfall (in) at Majuro

Daily Rainfall of at Least	Observed	2025	2050	2075	2100
3	1.1	1.1	1.1	1	1
4	1.3	1.2	1.2	1.1	1.1
5	1.7	1.5	1.4	1.3	1.3
6	2.7	2.2	1.9	1.7	1.6
7	5.5	3.8	3.0	2.5	2.3
8	15	8.2	5.8	4.4	3.8
9	59	24	14	9.2	7.4
10	350	95	44	24	18
11	>500	>500	192	85	54
12			>500	401	220
13				>500	>500

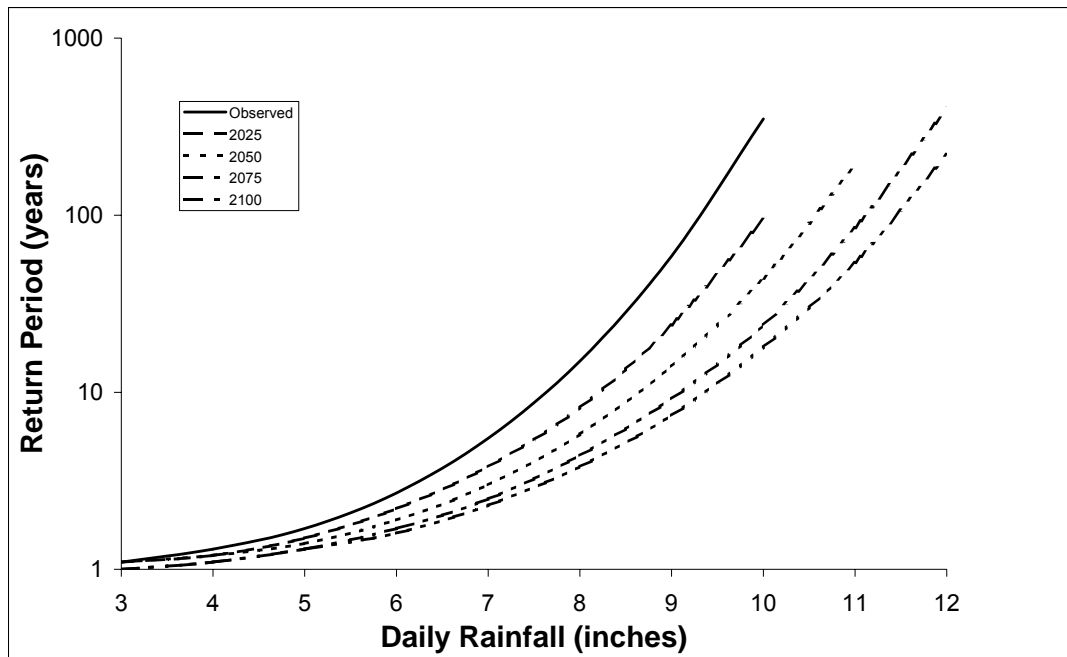


Figure 1.4: Relationship between daily rainfall and return period for Majuro, for present day and projected into the future.

#### B. Hourly Rainfall

Figure 1.5 shows the maximum hourly rainfall, by year, for Majuro. An hourly total of at least 2.4 in is a relatively rare event, with a return period of seven yr (Figure 1.6 and Table 1.2).

Table 1.2 and Figure 1.7 also show that global warming will have a significant impact on the return periods of extreme hourly rainfall events.

Table 1.2

Return Periods (yr), for Hourly Rainfall (in) at Majuro

Hourly Rainfall of at Least	Observed	2025	2050	2075	2100
1.4	1.1	1	1.0	1.0	1.0
1.6	1.2	1.1	1.1	1.1	1.0
1.8	1.4	1.2	1.2	1.1	1.1
2.0	1.8	1.5	1.3	1.2	1.2
2.2	3.0	2.0	1.7	1.4	1.4
2.4	6.9	3.4	2.4	1.9	1.7
2.6	24	7.5	4.2	2.9	2.4
2.8	162	25	9.9	5.4	4.0
3.0	>500	141	34	13	8.5
3.2		>500	203	49	25
3.4			>500	303	111
3.6				>500	>500

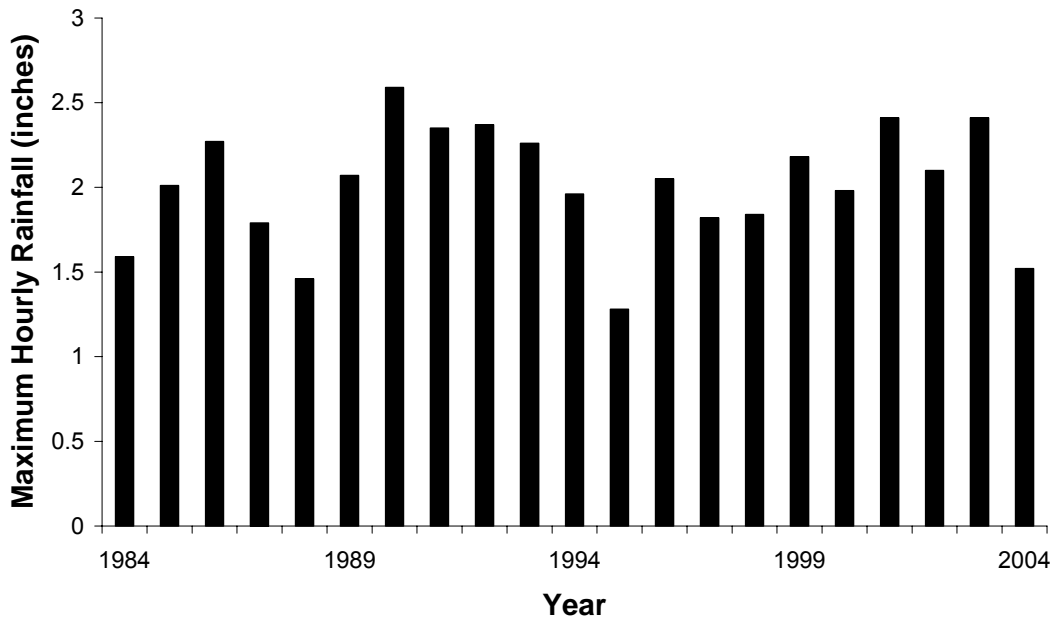


Figure 1.5: Maximum hourly rainfall, by year, for Majuro. Data for 1984 to 2004

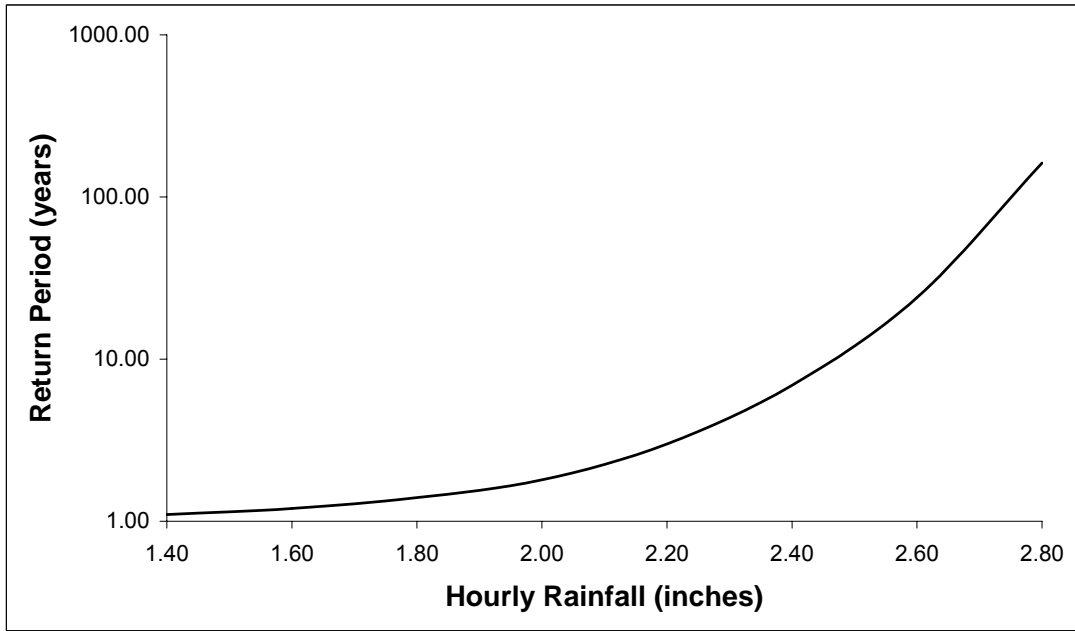


Figure 1.6: Relationship between hourly rainfall and return period for Majuro, based on observed hourly rainfall for 1984 to 2004.

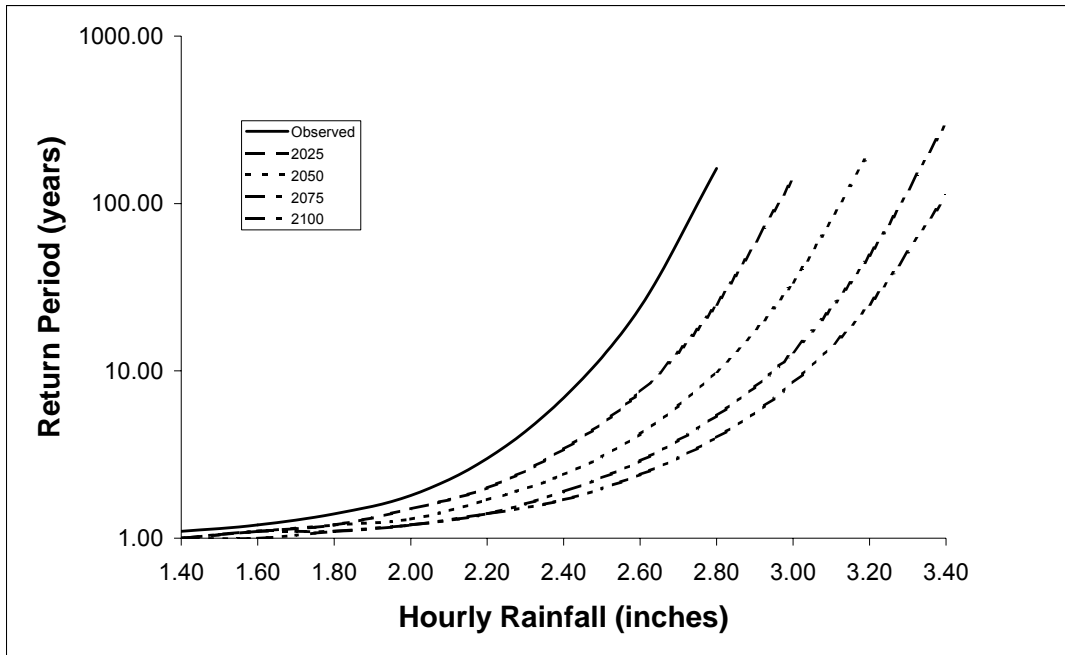


Figure 1.7: Relationship between hourly rainfall and return period for Majuro, for present day and projected into the future.

### Drought

Figure 1.8 presents, for Majuro, the number of months in each year (1954 to 2004) and each decade for which the observed precipitation was below the five percentile. A monthly rainfall below the five percentile is used here as an indicator of drought.

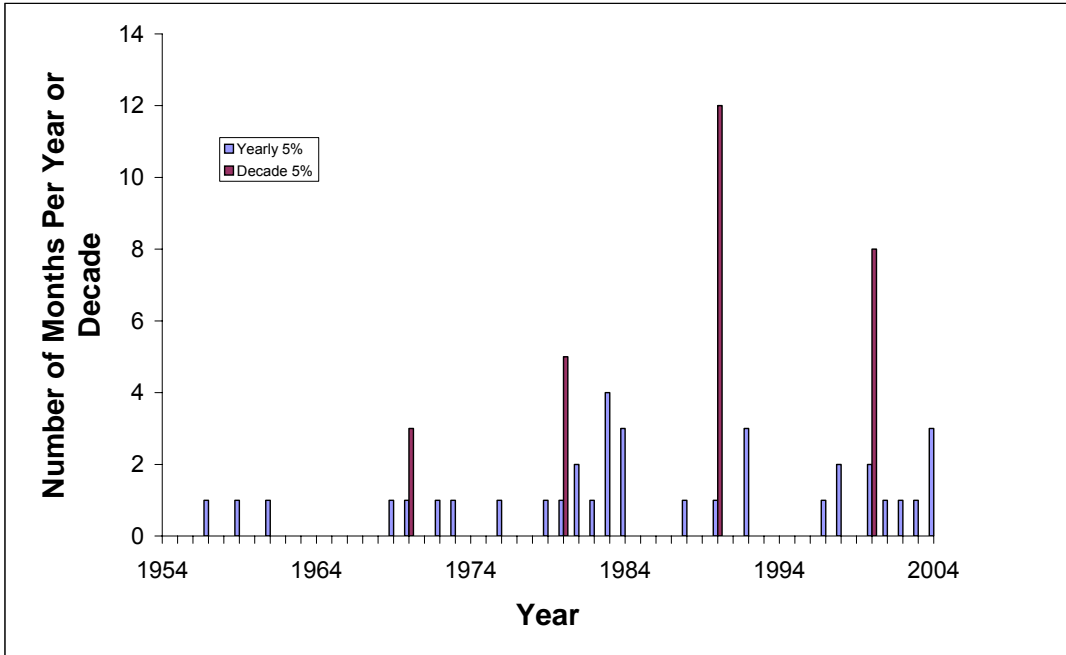


Figure 1.8: Number of months in each year and decade for which the precipitation was below the five percentile. Data for Majuro.

Most of the low rainfall months are concentrated in the latter part of the period of record, indicating that the frequency of drought has increased since the 1950s. The years with a high number of months with rainfall below the five percentile generally coincide with El Nino events.

Figure 1.9 shows the results of a similar analysis, but for rainfall estimates (1961 to 1990) and projections (1991 to 2100) based on the Canadian GCM and the A2 emission scenario.



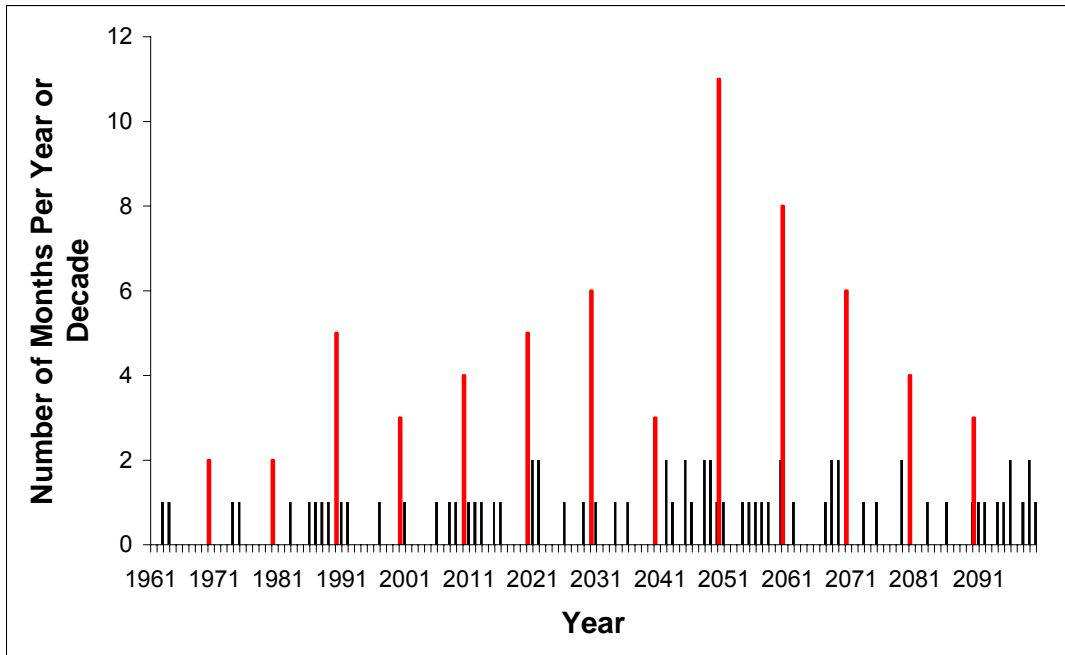


Figure 1.9: The number of months per year and decade for which the precipitation for Majuro is projected to be below the five percentile. Data from the Canadian GCM, with A2 emission scenarios and best estimate for GCM sensitivity.

Figure 1.9 also shows that the GCM replicates the increased frequency of months with extreme low rainfall during the latter part of the last century. The results also indicate that the frequency of drought will generally increase until the middle of the current century.

## High Sea Levels

Figure 1.10 shows daily mean values of sea level for Majuro, relative to mean sea level. There is large interannual variability in sea level as well as a long term trend of increasing sea level. The longer term trend in sea level for Majuro is approximately one inch per decade, slightly in excess of the global rate of sea-level rise during the 20<sup>th</sup> century (0.4 to 0.8 inches per decade).

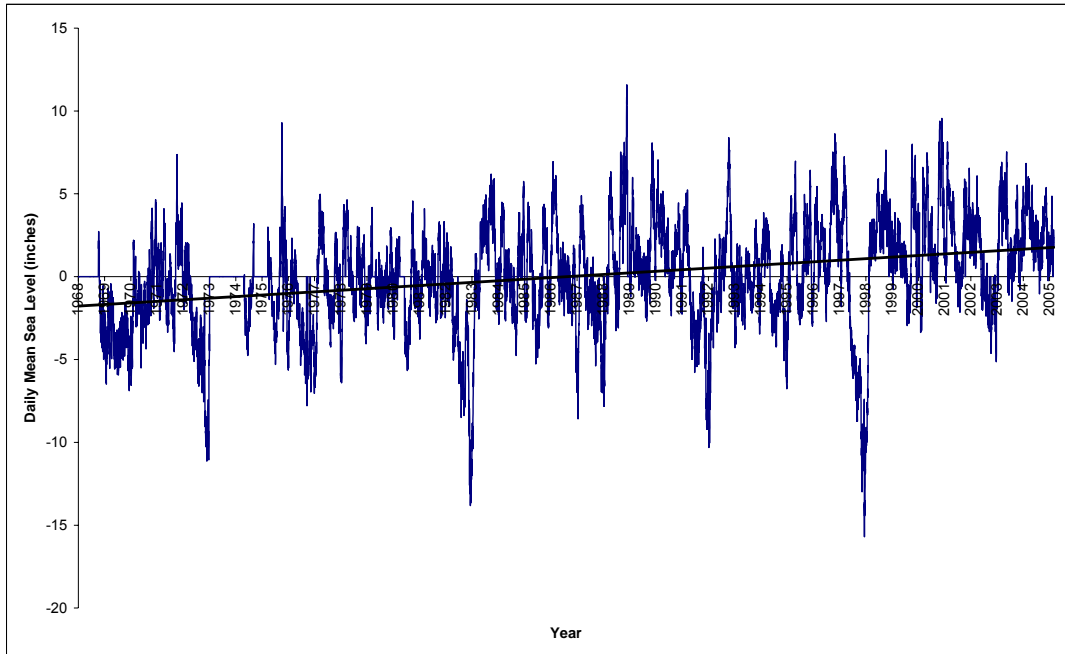


Figure 1.10: Daily mean values of sea level for Majuro (1968 to February, 2005), relative to mean sea level. Also shown is the linear trend in sea level over the same period.

Even more extreme high sea levels are evident in the mean hourly sea levels. Figure 1.11 presents the maximum mean hourly sea level, by year, for Majuro. The longer term trend in these maximum values is approximately 1.2 inches per decade, a rate slightly higher than the one inch per decade found for the daily mean values of sea level.

An hourly sea level four feet above mean sea level is a relatively rare event, with a return period of six yr (Figure 1.12 and Table 1.3).

Table 1.3 and Figure 1.13 show that global warming will have a significant impact on the return periods of extreme high sea levels that persist for at least an hour.

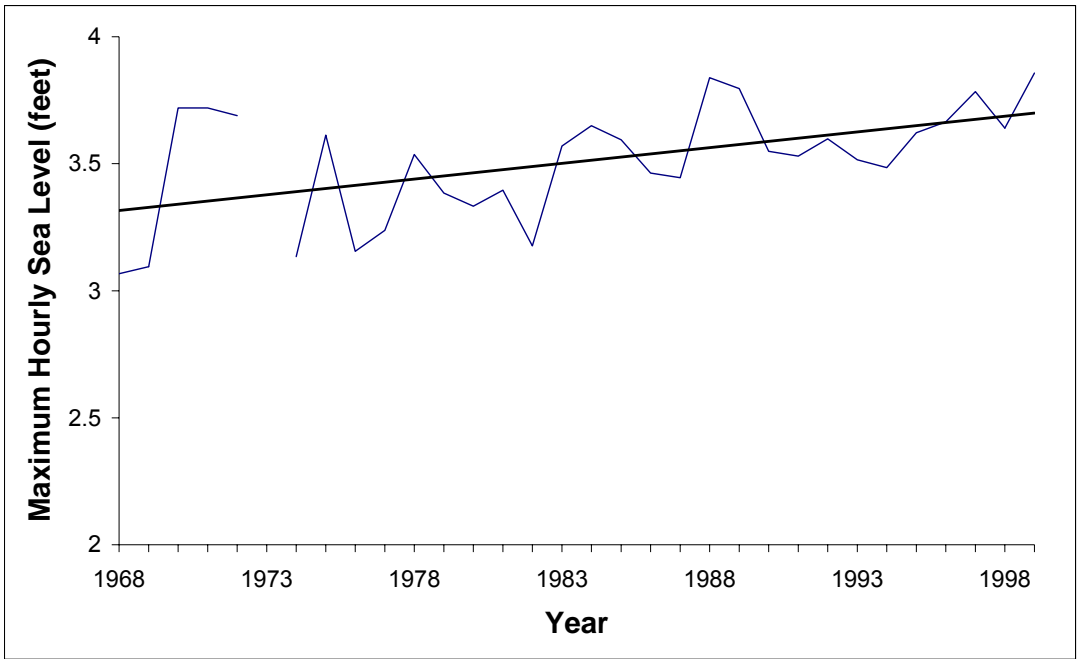


Figure 1.11: Maximum hourly sea level, by year, for Majuro (1968 to 1999). Also shown is the linear trend in these values over the same period.

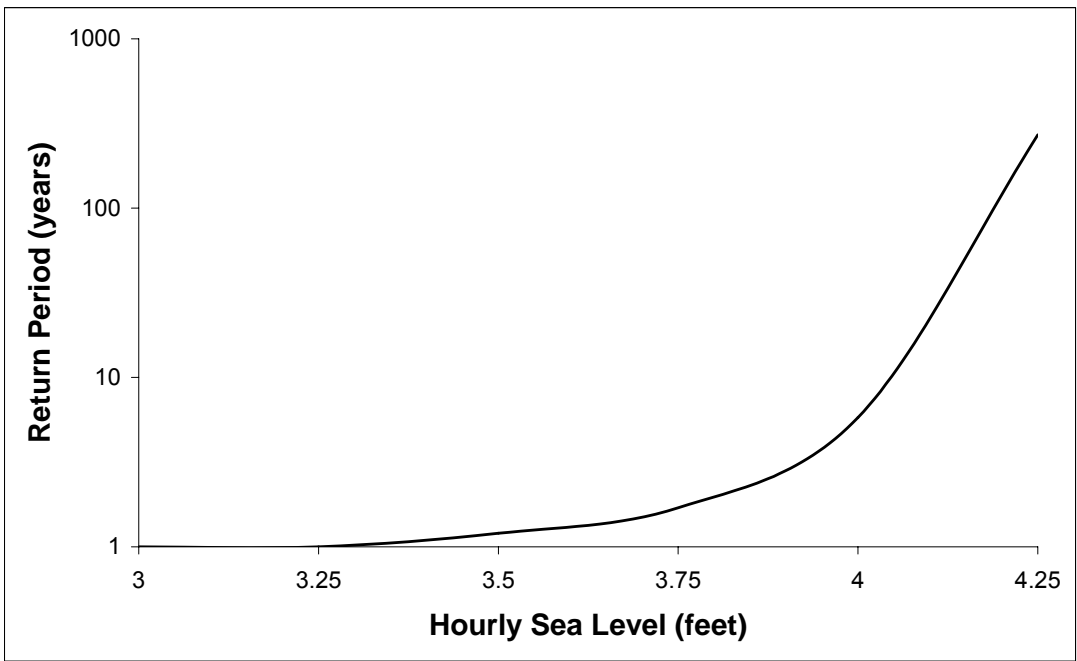


Figure 1.12: Relationship between hourly sea level and return period for Majuro, based on observed hourly sea level for 1968 to 1999.

Table 1.3

Return Periods (yr), for Hourly Sea Level (feet) at Majuro

Sea Level (ft) of at Least	Observed	2025	2050	2075	2100
3.00	1	1	1	1	1
3.25	1	1	1	1	1
3.50	1.2	1	1	1	1
3.75	1.7	1.1	1	1	1
4.00	5.8	1.6	1.1	1	1
4.25	271	5.2	1.2	1	1
4.50	>500	99	2	1	1
4.75		>500	11	1.2	1
5.00			>500	1.7	1
5.25				5.8	1.1
5.50				317	1.6
5.75				>500	4
6.00					101
6.25					>500

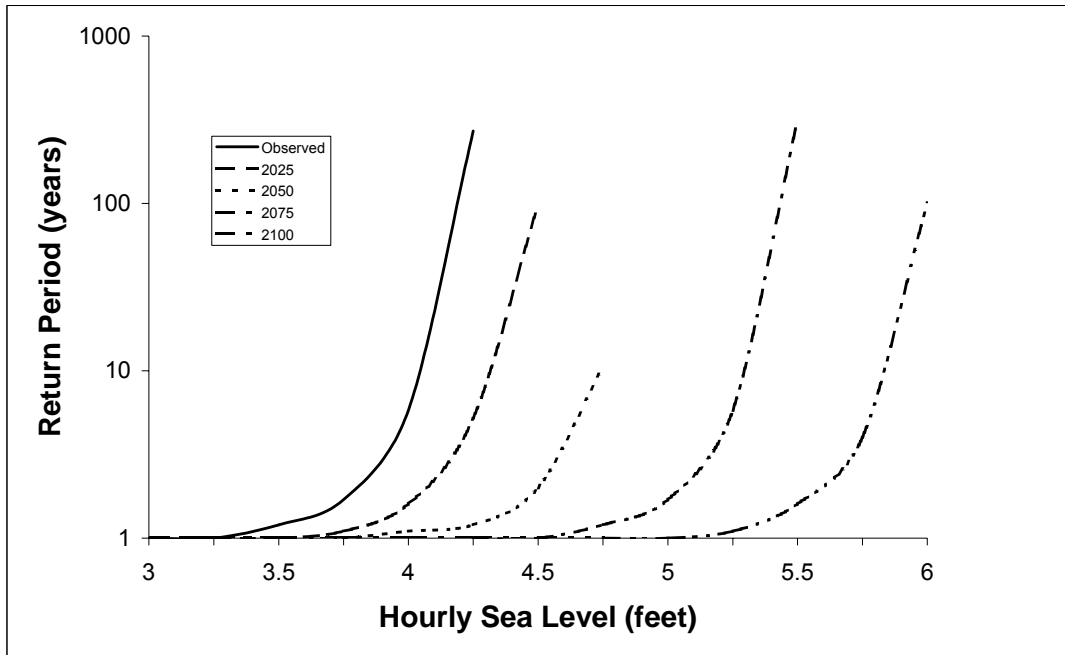


Figure 1.13: Relationship between hourly sea level and return period for Majuro, for present day and projected into the future.

### Extreme Winds

Figure 1.14 shows the annual maximum wind gust recorded in Majuro for the period from 1974 to March, 2005. In addition to the large interannual variability there is an indication of increasing extreme wind speeds over the past few decades. A peak gust of at least 35 knots

is a relatively rare event, with a return period of approximately 21 yr (Table 1.4 and Figure 1.15).

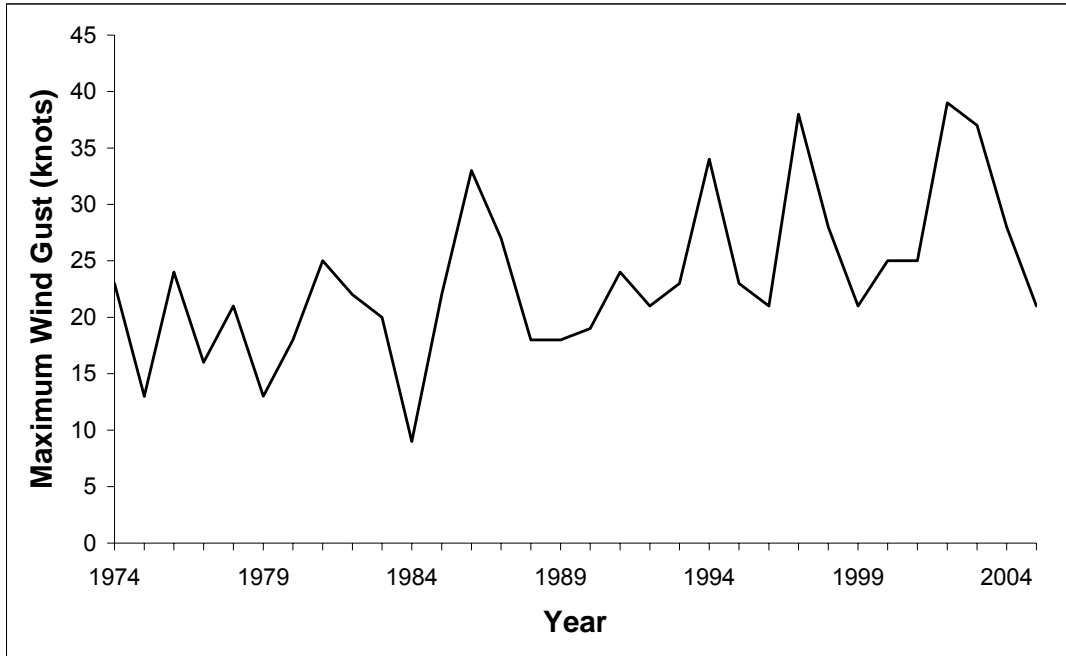


Figure 1.14: Annual maximum wind gust recorded in Majuro for the period from 1974 to March, 2005.

Table 1.4

Return Periods (yr), for Peak Gust (knots) at Majuro

Peak Gust of at Least	Observed	2025	2050	2075	2100
20	1.5	1.4	1.3	1.3	1.3
25	2.4	2.1	2	1.9	1.8
30	5.5	4.5	3.9	3.4	3.1
35	21	14	11	8.7	7.3
40	147	80	51	35	27
45	>500	>500	446	245	160

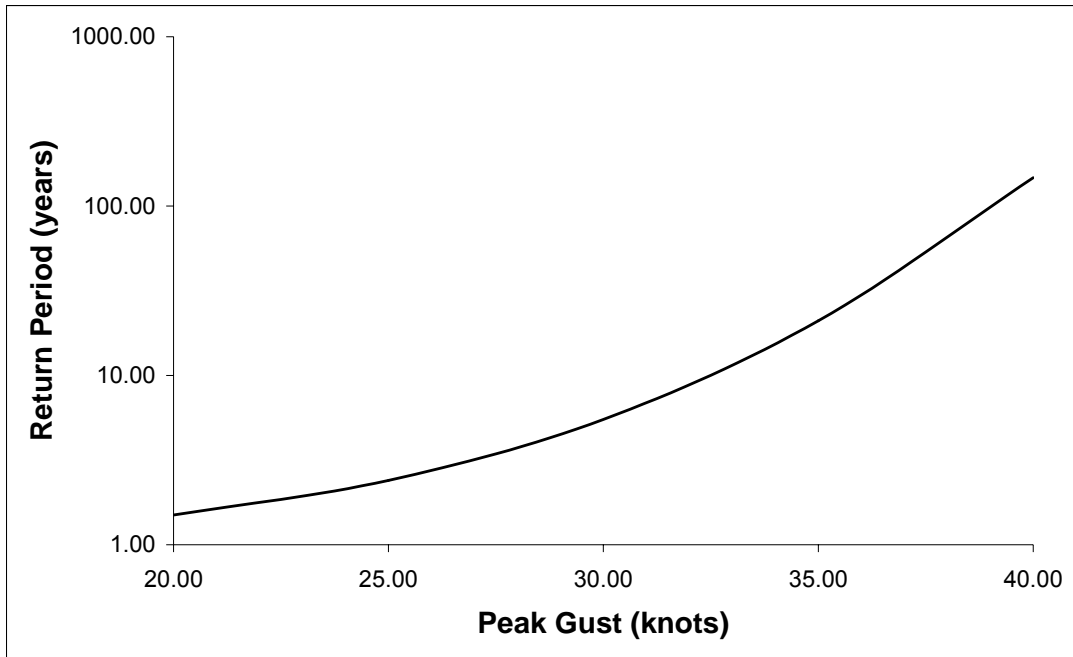


Figure 1.15: Relationship between peak wind gust and return period for Majuro, based on observed daily peak gust data for 1974 to March, 2005.

As shown in Table 1.4 and Figure 1.16, global warming will have a significant influence on the likelihood, and hence return periods, of extreme wind events.

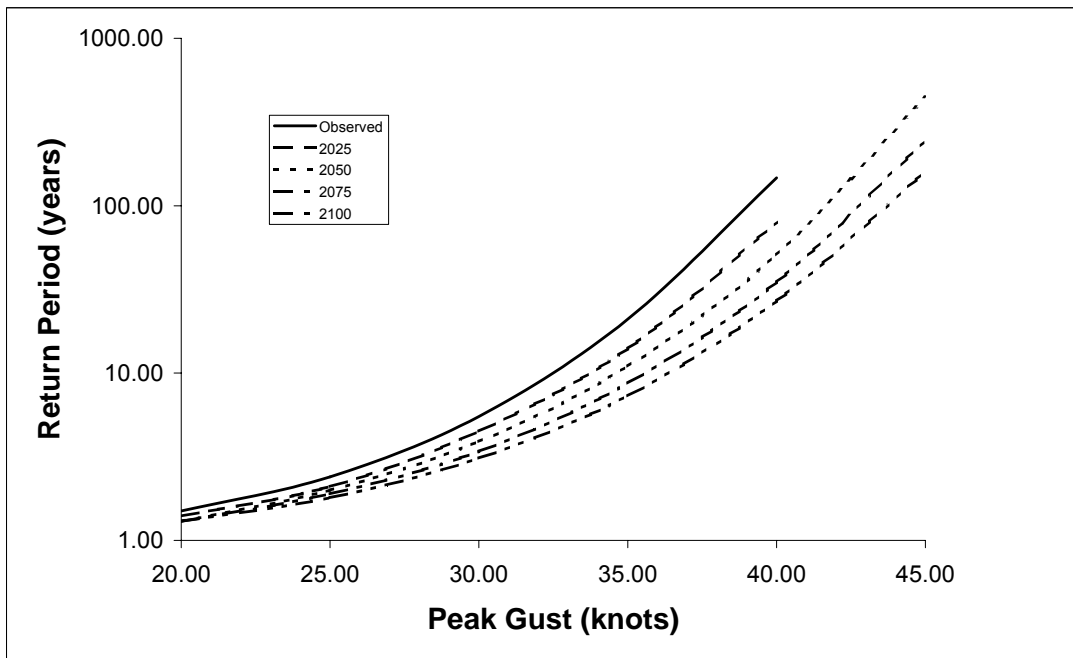


Figure 1.16: Relationship between peak gust and return period for Majuro, for present day and projected into the future.

## Extreme High Temperatures

Figure 1.17 shows the maximum temperature, by year, for Majuro. A maximum temperature of at least 91 degrees Fahrenheit (F) is a relatively rare event, with a return period eight yr (Table 1.5 and Figure 1.18).

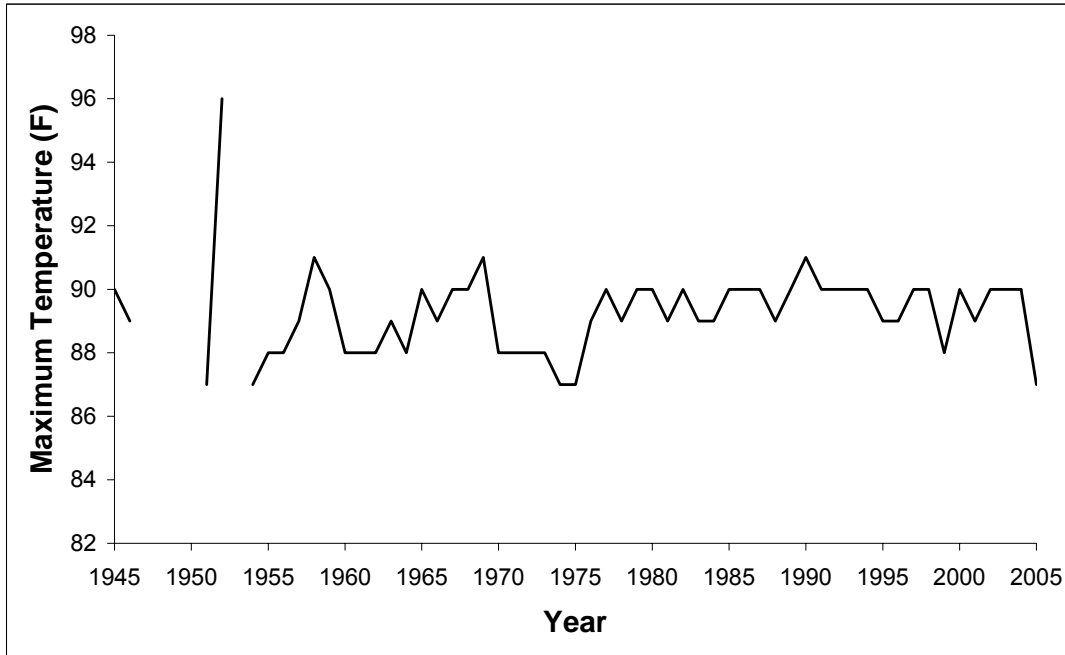


Figure 1.17: Maximum temperature, by year, for Majuro. Data for 1945 to March, 2005. Data missing for 1947-1950 and for 1953.

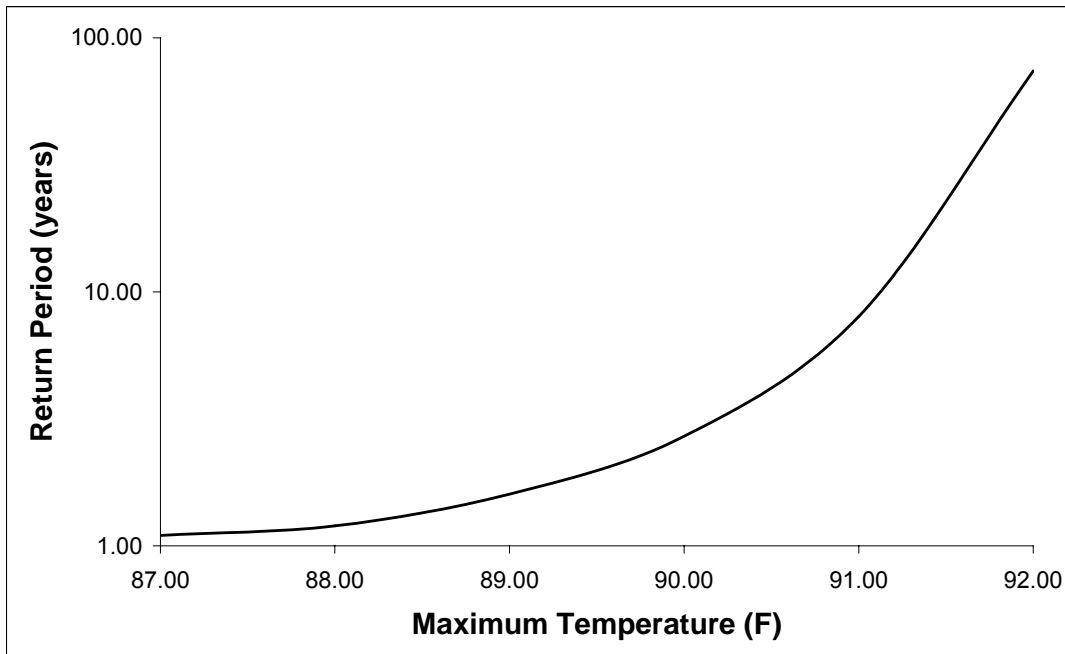


Figure 1.18: Relationship between maximum temperature and return period for Majuro, based on observed maximum temperature for 1945 to March, 2005. Data missing for 1947-1950 and for 1953.

As shown in Table 1.5 and Figure 1.19, global warming will have a significant impact on the likelihood, and hence return periods, of extreme high temperatures.

Table 1.5

Return Periods (yr), for Maximum Temperature (F) at Majuro

Maximum Temperature of at Least	Observed	2025	2050	2075	2100
87	1.1	1.1	1	1	1
88	1.2	1.2	1.1	1	1
89	1.6	1.3	1.2	1.1	1.1
90	2.7	1.7	1.4	1.2	1.1
91	8	3.1	2.1	1.6	1.3
92	74	11	4.6	2.6	1.9
93	>500	141	24	7.6	3.7
94		>500	>500	67	15.3
95				>500	282
96					>500

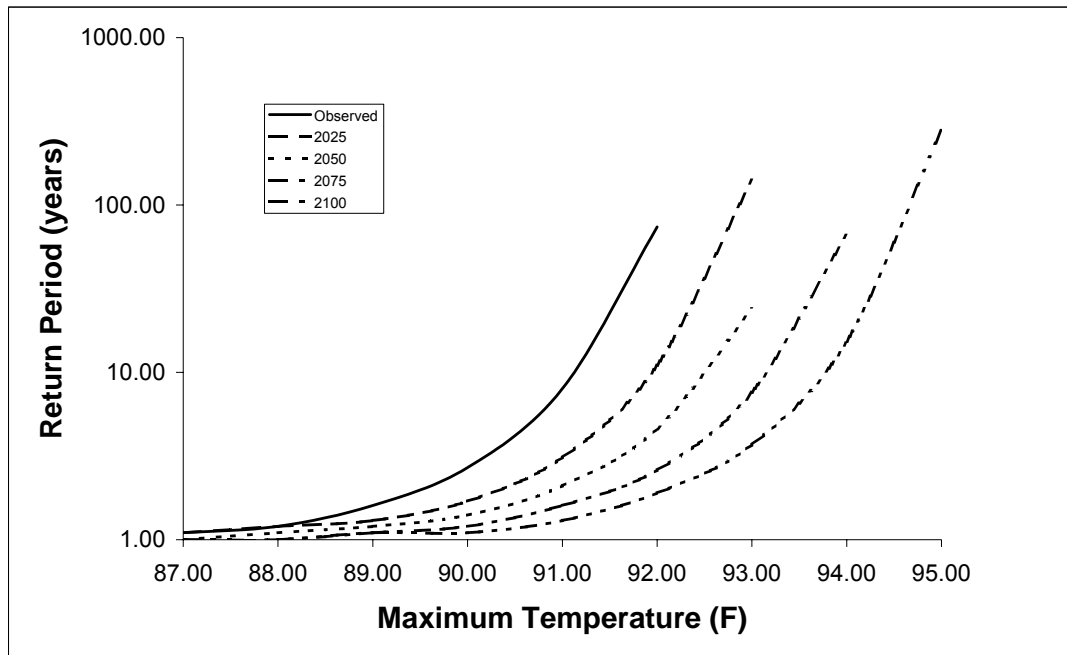


Figure 1.19: Relationship between maximum temperature and return period for Majuro, for present day and projected into the future.



## Appendix 2

### List of Individuals Consulted<sup>3</sup>

Mr. Charles Paul	Chief of Performance, Monitoring & Evaluation Division, EPPSO
Mr. Ted Tarkon	Assistant General Manager, Environmental Protection Agency
Mr. Jefferson Barton	Secretary of Finance
Mr. Glen Joseph	Director, RMI Marine Resources Authority
Mrs. Dolores dB Kattil	General Manager, RMI Visitor's Authority
Mr. Witten Philippo	Minister in Assistance to President
Mr. Jerry Nathan	Officer, Trade & Investment Division, Ministry of Resources & Development
Ms. Atina Myazoe	Chief of Energy Division, Ministry of Resources & Development
Mr. Frederick Muller	Secretary of Resources & Development (R&D)
Mr. John Bungitak	General Manager, EPA
Mr. Jimmy Joseph	Chief of Agriculture Division, Ministry of R&D
N. & B. Vanderbelt	Consultants
Mr. Fredrick deBrum	Assistant Secretary, Ministry of Public Works
Ms. Amentha Matthews	Director, Land Registration Authority
Ms. Biriam Stege	Secretary of Education
Mr. Clement Capelle	Chief, Disaster Management Unit
Mr. Raynard Gideon	Assistant Secretary of Foreign Affairs
Mr. Wilbur Allen	Secretary of Internal Affairs
Mr. Jerry Kramer	CEO, Pacific International Inc.
Mr Gregory Tarasar	Chief Financial Officer, Pacific International Inc.
Mr Witten Barry	Assistant Manager of Tobolar
Mr Wilfredo Candilas	Plant Manager, Tobolar
Mr. Wallace Peter	Assistant Secretary, Ministry of Transportation & Communication
Francis C. Domnick	Chamber of Commerce and Chief Administration Office, College of the Marshall Islands
Mr. Posesi Bloomfield	Assistant Attorney General
Mr. Fredrick Langimore	Historic Preservation Office, Ministry of Internal Affairs
Mr. Eldon Note	President of Mayor's Association and Mayor of Bikini
Mr. Riley Albertter	Mayor of Majuro Atoll
Mr. Billy Roberts	GM Marshalls Electric Company
Mr. Amon Tibon	GM Development Bank of Marshall Islands
Mr. Terry Mellan	Manager, RMI Water & Sewage Company
Mr Bruce Billmon	Director, Budget/OIDA, Ministry of Finance
Ms Marie L. Maddison	Advisor/Administrator, Women United Together in the RMI and President, Marshall Islands Council of Non-Governmental Organizations
Mr Steve Why	Executive Director, Marshall Islands Conservation Society
Mr Tim O'Meara	Consultant
Mr Stepen Phiilp	Branch Manager, Moylan's Insurance Underwriters
Mr Jose Tapel	Moylan's Insurance Underwriters
Ms. Yumiko Crisostomo	Director, Office of Environmental Planning and Policy Coordination
Ms. Deborah Barker	Deputy Director, Office of Environmental Planning and Policy Coordination
Mr Terry Keju	Chief of Policy/Planning Officer, RMI Marine Resources Authority
Ms Lihla Noori	Environmental Protection Authority
Ms Caleb McClennan	Environmental Protection Authority
Mr Reginald White	Director, Weather Service Bureau
Mr Dean Jacobson	College of the Marshall Islands
Mr Don Hess	College of the Marshall Islands
Mr Lee Jacklick	Weather Service Bureau

<sup>3</sup> Excludes Jaluit Atoll consultations and National Dialogue – see Appendices 3 and 4, respectively.

## **Appendix 3**

### **Report on Participatory Stakeholder Consultations Held on Jaluit Atoll**

#### **Background**

The Asian Development Bank (ADB) uses the country environmental analysis (CEA) as the tool to assist with early incorporation of environmental considerations into the country strategy and program (CSP) for its Developing Member Countries (DMC). The CEA provides targeted information necessary for informed decision making to address, in an appropriate manner, environmental constraints, needs, and opportunities, including those that impinge upon poverty partnership agreements. The focus is on adding value to planned and ongoing development initiatives by reducing environmental constraints and exploiting environment-related opportunities.

Preparation of the CEA involves a participatory process at both country and ADB levels. It is initiated before the CSP, and continues through CSP preparation. The CEA is directed at the policy, program, and sector levels, but it also highlights issues and opportunities associated with environmentally sensitive projects in the pipeline.

As part of the participatory consultation for preparation of the CEA for the Republic of the Marshall Islands (RMI) a stakeholder consultation was held in Jaluit Atoll, RMI, on April 30, 2005.

#### **Venue**

The stakeholder consultation was held at the Fish Base, Jabor, Jaluit Atoll.

#### **Participants**

The participants represented a wide cross-section of the Jabor community. A list of participants is provided in Annex 1.

#### **Opening Session**

Ms Ellia Sablan-Zebedy welcomed participants to the consultation meeting and outlined the purpose of the meeting, including how the increased understanding gained through the consultation would be used in the CEA. She noted that several “priority areas” had already been identified as a result of previous consultations. The intent was to gain an outer island perspective on these areas, and also determine if there were other priority areas.

#### **Discussion of Priority Areas**

##### **A. Coastal Protection**

Coastal erosion is a major issue, and is already affecting many locations, both ocean and lagoon side. An area of particular concern is in the vicinity of the high school. There are now safety concerns as erosion has resulted in safety hazards for students. The erosion is such that in some areas near the school there is now insufficient room for traditional methods of shoreline protection.

##### **B. Quality and Security of Supply of Drinking Water**

Rainwater catchments are used for drinking water. Boiling the water is encouraged. Groundwater is used for other purposes. People are encouraged not to take groundwater

from areas near toilets, pig pens, grave sites etc. Participants knew that the Economic Policy, Planning and Statistics Office (EPPSO) had reported that over 90% of water supplies were contaminated, based on analyses conducted by the Environmental Protection Agency (EPA). However, they had not been informed as to the cause and source of contamination, and what precautionary actions to take in the short (e.g. was boiling sufficient?) and longer terms (e.g. how to prevent ongoing contamination).

Further discussion revealed that the community had been advised to plant trees around their houses, in part to reduce salt contamination of the rainwater collected from roofs. However, participants pointed out that this allowed cats and rodents onto the roof. This is probably the source of fecal contamination.

During the most recent El Niño, a reverse osmosis plant was installed because of the drought, to provide a source of drinking water. But since then the person trained to operate the plant has died, and the equipment has been pillaged. It has also deteriorated due to lack of maintenance, and would no longer be operational during a drought. Other options for obtaining water during the drought were to buy water brought from Majuro or to travel by boat for half a day in order to obtain water from an uninhabited islet that still had functioning wells. Local well water is also used, after boiling. But as it is very brackish the water is not pleasant to drink. The high school, which has a large number of pupils as it is an education center, has to close during periods of water shortage. Even during normal times there is a problem of providing sufficient water for the school.

#### C. Fuel Substitution

Gasoline is currently \$4.25 a gallon on Jaluit. Participants commented that it would be good to make better use of coconuts, as there are so many of them. They were also interested because of the many other uses for coconut oil – cooking, products etc. The rising price of fuel also made the option attractive.

However, it was noted that care would have to be taken to ensure the support of the *Iroj* and *Alabs*. They are now paid a portion of the money raised through the sale of copra. How would they be compensated when the copra was pressed on island, and the fuel used for subsistence purposes? Any new technology must satisfy all stakeholders. In the case of copra, there must be enough to sell for products, so that money can be paid to the *Alabs* and *Iroj*.

#### D. Food Security

The supply of fish is decreasing – fishers now have to travel further in order to catch fish. In the past it was possible to fish from ones own property. The community-managed marine conservation project needs assistance as the conservation areas are not working well. People need the money from selling fish, so they are not complying with the conservation practices.

The conservation project, managed by EPA and funded by SPREP, included development of a management plan. Optimal areas for sanctuaries, and scientific studies were identified. Buoys were used to mark the boundaries of these areas. The sanctuaries have been successful and there are now increasing amounts of marine resources for food. This is different to what is happening in other islands. The community is able to meet its own food requirements, as well as being able to sell surplus fish for transport to Majuro.

The sanctuaries include 14 prohibited areas of up to 5 acres. These are harvested approximately every 3 months, depending on the numbers of organisms present. In 12 other sanctuaries harvesting is banned unless it is approved by the traditional leaders.

But people did not understand the reasons why these areas were being protected. Enforcement was weak, as the wider community did not know about the existence of the protected areas. Also the buoys were not properly anchored, and many have been lost during storms. The sanctuaries were intended to serve as nursery areas for juvenile marine organisms, and were located in areas where the currents would disperse the organisms to other areas.

The funding for the project has now stopped, but the community is still continuing with protection, using traditional methods.

The best approach is to use the traditional system, raise public awareness and to have a system that is self governing, with self ownership and self regulation. It is not useful to use enforcement based on fines, as this does not result in cooperation.

When the causeway was constructed in Jaluit-Jaluit, water flows in the mangrove area were disrupted, destroying the crab habitat and thus reducing food security. But this change also reduced salt water intrusion, so coconut palm production has increased, making the land owners happy.

The garden in Jabor is part of the school teaching program, and is very successful.

#### E. Outer Island Transportation

One problem with the transport system occurs because by the time the field trip ship reaches Jaluit (normally its last port of call for the field trip), it is full and can't take any more copra. The ship operators say they will "come back next week", but by the time the ship arrives it is full again. Jaluit is said not to be producing copra, but the problem is with the shipping, not with copra production. Another problem is that copra producers are not being supplied with sacks – the usual practice was to provide an empty sack for each full sack uplifted. But the ship is often out of empty sacks.

There was little difference in the quality of service when the private sector operated the field trips, as the Government set the field trip schedules. But costs were higher.

Arranging to send freight from Majuro to Jaluit is a complex, time-consuming and an expensive process. A person has to go to the Ministry of Transport and Communications to book the freight on the ship, then pay fees to the Ministry of Finance, and subsequently book with the Port Authority for handling the freight. The cost of travel between these agencies, plus the time taken, makes the process very expensive. The ideal situation would be to co-locate the three agencies.

The transport situation is not so serious for stores, as there are frequent trips between Majuro and Jaluit by small private craft.

Both freight charges and passenger fares between Majuro and Jaluit are increasing, adding to hardship. The cost of intra-island travel is also very expensive – it is more expensive to make a boat trip from one end of the atoll to the other, than it is to fly to Majuro.

#### F. Land Use Planning, Zoning and Land Tenure

The entire land area of Jaluit Atoll used to belong to the Government, but now all the land has been returned to the traditional owners. There is a need to distinguish between the traditional and modern systems of land ownership. They need to co-exist, as each has its authority, roles and responsibilities. Even the Constitution does not make the distinction – it

allows for both. Even though there is an opportunity to change the Constitution, the agenda is set by Government. Issues of public concern are not being discussed.

The National Government should consult with Local Government before development occurs, as Local Government knows where best to develop land for specific uses.

#### G. Early Warning System

The old system was based on HF radio. It worked well, with everyone having access. The Government radio station is listened to by most people, but it is not on air during the early morning hours. People switch off their radios to conserve power and protect batteries.

The new system is too advanced. It is handled by the National Telecommunications Authority (NTA). There are 7 sets in Jaluit. When there is a power outage the system will not work. Also, if the NTA operator is not available there is no access to the radio.

SSB is also used, and radio sets are located in the Mayor's office, the fish base, shop, high school and hospital. But again this system is not useful for early warning when people are in their homes, and sleeping.

NTA has a memorandum of understanding to handle warnings, but there is no emergency plan in place. There is no one designated to be in charge and there is no awareness raising, for example regarding what action to take in an emergency. In Jabor the best option would be to go to the school, but elsewhere in Jaluit there are few options.

There is a problem with maintenance and servicing for all radio systems.

#### H. Waste Management

Currently most waste (inorganic, organic and some hazardous waste) is disposed of in an area separated from the lagoon by a sea wall (gabion basket). When the tide is exceptionally high (2 or 3 times a month), waste floats over the sea wall and into the lagoon. There are plans to separate organic waste from other waste in Jabor, and dispose of this waste at a special site on the ocean side, in order to build up and protect the shoreline. Some of the waste will also be used for composting for the school garden.

School children used to collect cans and be paid for each can. The cans were sent to Majuro for recycling. There are plans to start this program again.

A Local Government ordinance is to be passed, limiting packaging including plastic bags and promoting the use of paper bags. It will also limit the use of plastic diapers.

The Local Government needs heavy equipment (e.g. a back hoe) to move waste from the road side into the dump. At present the waste builds up beside the road. MEC used to have equipment that could move the waste, but it is no longer operational. Now the only option is to move the waste manually.

Hazardous waste, such as that from MEC, is not going into the dump. It is placed in containers and sent to Majuro by MEC.

For waste management, the Local Government has good relationships with MIVA, EPA and MEC.

## Annex 1

### List of Participants

1	Mr. Alden Jacklick	Jaluit High School (counselor)
2	Mr. Kaaj Mojilong	Private Sector
3	Mr. Jordan Lomae	Retiree
4	Mr. Miram Ankeid	Jaluit Councilman
5	Mr. Alden Nemra	Marshalls Electric Company (MEC)
6	Mr. Thurston Mejjena	Fish-base (MIMRA)
7	Mr. Ken Jeton	Hospital
8	Mr. Arijji Enos	Jaluit Councilman
9	Ms. Newij Lomae	Business woman
10	Mr. Dennis McFarland	Jaluit High School
11	Ms. Shine Benkim	Jaluit High School (housemother)
12	Ms. Rina Matuto	Jaluit High School (cafeteria)
13	Ms. Emra Amsa	National Telecommunication Operator
14	Mr. Shio Jerus	Jaluit High School (teacher)
15	Mr. Melen Joseph	Jaluit High School (Librarian)
16	Mr. Edy Brotoisworo	Senior Environmental Specialist
17	Ms Ellia Sablan-Zebedy	Consultant
18	Prof. John E. Hay	Consultant

## **Appendix 4**

### **Report on the National Dialogue**

#### **Background**

The Asian Development Bank (ADB) uses the country environmental analysis (CEA) as the tool to assist with early incorporation of environmental considerations into the country strategy and program (CSP) for its Developing Member Countries (DMC). The CEA provides targeted information necessary for informed decision making to address, in an appropriate manner, environmental constraints, needs, and opportunities, including those that impinge upon poverty partnership agreements. The focus is on adding value to planned and ongoing development initiatives by reducing environmental constraints and exploiting environment-related opportunities.

Preparation of the CEA involves a participatory process at both country and ADB levels. It is initiated before the CSP, and continues through CSP preparation. The CEA is directed at the policy, program, and sector levels, but it also highlights issues and opportunities associated with environmentally sensitive projects in the pipeline.

As part of the participatory consultation for preparation of the CEA for the Republic of the Marshall Islands (RMI) a National Dialogue was held in Majuro, RMI, on April 28, 2005.

#### **Objectives of the National Dialogue**

The main objectives of the national dialogue were to:

- review the preliminary findings and recommendations of the ADB consultants, and add value to these through a group discussion that took a more holistic view of the constraints, needs, and opportunities the environment provides for development in the RMI; and
- to seek consensus on the priority areas and interventions that will reduce environmental constraints and take advantage of the development opportunities provided by RMI's environmental assets and natural resources.

#### **Program and Venue**

The program for the National Dialogue is provided in Annex 1. The National Dialogue was held in the Nitijela Conference room, Capitol Building, Majuro.

#### **Workshop Participants**

The participants represented a wide cross-section from various sectors, including National and Local Governments, NGOs, community groups, women's groups, academia, and the private sector. A list of participants is provided in Annex 2.

#### **Opening Session**

The National Dialogue opened with a prayer, delivered by the Reverend Enja Enos. In his opening remarks, the Hon. Witten Philippo, Minister in Assistance to the President, highlighted the importance of the environment to the future of the RMI, and acknowledge the important technical and financial assistance provided by the Asian Development Bank (ADB).

Mr. Edy Brotoisworo of the Asian Development Bank described how the ADB Poverty Reduction Strategy, Long-Term Strategic Framework (2001–2015), and the Medium-Term Strategy (2001–2005) promote the integration of sound environmental management into development planning processes and require environmental concerns to be integrated into all ADB operations. ADB's Environment Policy (2002) specifies the CEA as the tool that may help assist early incorporation of environmental considerations into the country strategy and program (CSP). Therefore, the CEA for the RMI is undertaken as integral part of the CSP process.

He also noted that in the recently published Pacific Region Environmental Strategy (PRES) 2005-2009, eight environmental challenges were identified as being of highest priority in the region: (i) threats to freshwater resources, (ii) degradation of the marine and coastal environment, (iii) degradation of land and forest, (iv) problems of urbanization and waste management, (v) depletion of biodiversity, (vi) concern on energy use, (vii) adaptation to climate change, and (viii) weaknesses in environmental management capacities and governance. These are common problems for the small islands development states in the Pacific, which most of problems are also experienced in the RMI.

Mr. Brotoisworo also explained the country strategy and program update (CSPU). This document is prepared together by ADB and the Government, describing ADB lending and non-lending programs for the country for the next 2 years. The document is prepared through wide consultation involving various stakeholders. The CSP is reviewed and updated every year. ADB presently implement the Country Strategy and Program Update (2005-2007) for the RMI. The current strategy prioritizes: (i) improved delivery of basic social services; (ii) improved opportunities for economic gain; and (iii) improved governance, specifically strengthening of government policy. This conforms to both the RMI "Priorities of the Poor" and to the Pacific Strategy, 2005 to 2009. Since joining ADB in 1990, the RMI has received 12 loans totaling over \$78 million and 44 country specific TA grants totaling over \$17 million, or an average of about one loan of \$6.5 million and about three grants worth \$1.3 million per year. Two loans of \$15.5 million<sup>4</sup> and five TAs of \$2.62 million were active. Almost all loan funds come from the Asian Development Fund (ADF).

Ms Yumi Crisostomo, Director of the Office of Environmental Planning and Policy Coordination (OEPPC) outlined why it's important to mainstream environmental considerations in development planning and processes. She noted that in this context mainstreaming refers to the integration of environmental policy considerations into core institutional thinking, along with other policies and related activities, as well as with coordination and harmonization, to ensure policy coherence. Mainstreaming is thus a way of finding some balance that will help us address gaps between environmental protection and economic growth. She also highlighted how the JENROK Socio-economic survey showed people have difficulty meeting basic needs, there is population stress and high unemployment, and significant health issues, especially related to water borne diseases. The recommendations arising from the Jenrok study included, as short term goals, water quality and access, recycling of cans, community clean ups and increased public awareness. Longer term goals included more economic incentives such is in waste management, and improved international collaboration. There are economic opportunities through waste management initiatives (e.g. international partnerships, biodiversity conservation, and through climate change (e.g. renewable energy and effective use of energy).

Ms Crisostomo also highlighted that there can be no sustainable social progress or expansion of economic activity unless the natural foundations for human existence are maintained, and there can be no effective protection of the integrity and diversity of natural

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<sup>4</sup> Skills Training & Vocational Education Project (\$7.6 million) and Outer Island Transport Infrastructure Project (\$7.9 million)



ecosystems, rational use of natural resources or equitable sharing of benefits unless the necessary institutions are developed.

Finally, Ms Ellia Sablan-Zebedy provided participants with additional information regarding the purpose of the dialogue, the agenda, and the dialogue process. The latter involved most presentations and discussions being in Marshallese, question and answer sessions after each presentation, validation of findings, and reaching a consensus on recommendations to Government and ADB re mainstreaming environment in RMI's CSP.

### **Importance of Environment to RMI, and Sound Environmental Management**

Ms Dolores deBrum-Kattil, General Manager of the Marshall Islands Visitors Authority (MIVA) demonstrated the importance of a quality environment to the tourism industry of RMI. The tourism industry in RMI is currently very small. The total number of visitors to the RMI arriving by air ranges between 4,000 and 6,000 per year, with an estimated spending of \$2-3 million. People coming to RMI on business make up around 40% of arrivals. Tourists average less than 1,000 per year. The main attractions are diving and snorkeling, fishing, culture, history and the people. All require a high quality of the environment if tourists are to come to RMI.

One objective of MIVA is to develop popular awareness of, and support for, tourism development and environmental preservation, given the strong relationship between the two. MIVA has earned a reputation as a vocal agent for increased tourism and environmental awareness. It works with members of the community and with government agencies that have interest in support of environmental matters and sustainable development for the RMI.

MIVA is committed to strengthening its collaborative environmental planning relationships with Majuro Local Government (MalGov), the Ministry of Health, the Ministry of Works, MIMRA, OEPPC, EPA and the Chamber of Commerce through such activities as: (i) assisting CMI with the "Cans for Education" project - a can collection project where profits are to be utilized towards future training efforts for the teachers of the college; (ii) exploring ways to utilize crushed glass in the production of asphalt to decrease the mining of sand and gravel; (iii) tree-planting activities around Majuro Atoll especially on roadside and in public areas; (iv) establishing more stringent rules and regulations (with MalGov) on use of trash bins, plus introduction of recycling bins at each trash bin location; (v) imposing a requirement (with MalGov) for all licensed take-out stores to be furnished with at least one trash bin; (vi) working with the local councils to improve community clean up efforts by either re-introducing the "adopt a highway" program or introducing a community incentive program for playground or sports facilities in their communities; (vii) inviting the local councils to have the residents and schools in their jurisdictions to participate in World Beach Clean-Up Day every October; and (viii) on Environment Day or Earth Day, having the President or the Mayor deliver a "State of the Environment" address on TV, radio and the newspaper.

One of the constraints faced by the tourism sector is transportation. Air Marshall Islands does not provide air services in a timely manner. To date there have been no social problems with tourists in the outer islands. The biggest problem is stolen historic artifacts. At present, RMI is unable to protect the designs and styles of its handicrafts. These are unique, and it is difficult for other countries to copy them. MIVA concentrates on niche marketing as it is too costly for tourist to come to RMI due to airline constraints. RMI does not want more than 10,000 tourists a year, taking into account accommodation, airline and other constraints.

Mr John Bungitak, General Manager of the Environmental Protection Authority (EPA), outlined the ways in which the EPA is striving for improved environmental management by all members of society, the Government and the private sector. One focus is to increase

public awareness and understanding of national and local environmental issues, and to promote educational support for sustainable management efforts. This includes completion of EPA website, a weekly radio program, a monthly article in the newspaper, production of pamphlets, visits to schools and community awareness programs. EPA is also undertaking initiatives related to coastal management and earth moving, with emphasis on monitoring and regulating development activities of the coastal zone and evaluating and issuing approved earthmoving permits. Initiatives include coastal management plans for Majuro, Ebeye, Wotje, and Jaluit Atoll and draft coastal management regulations. In 2004, 30 major project permits were issued, along with 104 minor project permits, 20 earthmoving/seawall violations, 30 oil-spills violations and 123 vessel clearances.

With respect to biodiversity research and liaison, the focus of EPA is on assisting existing national conservation projects, helping to develop new projects, raising public awareness in biodiversity and conservation, and supporting implementation of the National Biodiversity Action Plan. Water quality and environmental health activities include regulating and monitoring the quality of fresh and coastal waters in the Marshall Islands. The solid waste management program assists the general community with sound practices in the safe management of the solid waste including reducing health hazards and degradation of the environment and natural resources. Initiatives related to persistent organic pollutants include monitoring of toxic chemicals that persist in the environment and enter into the food chain, posing a risk of adverse effects to human health and the environment, including air, water and land. EPA is also responsible for efforts to prevent the importation of the group of chemicals that cause global environmental damage to the ozone layer in the earth's atmosphere – ozone depleting substances. It is part of the coordinated global effort to phase out the use of these chemicals.

Areas where EPA is demonstrating increasing effectiveness include reduction of oil-spill violations, water quality monitoring has been extended to the Outer Islands, there are fewer reports of sale of expired foods, restaurants are meeting inspection criteria, the public dump site is better managed, there are fewer reports of earthmoving violations and RMI is in compliance with the Montreal Protocol. Opportunities for improved performance include integrating environmental impact assessment into major project planning, appointing a local counterpart for the Biodiversity Conservation Officer, revision of the water quality regulations, protect and manage the Laura and Delap water lens, continuation of the Outer Islands water quality management programs, revision of the Solid Waste Management Regulations to include hazardous wastes, institutional strengthening and capacity building, lack of access to international funding opportunities. Solid waste enforcement is hindered by traditional land rights issues, while violations are being held up at Attorney General's Office.

### **Key Findings in the Country Environmental Analysis**

Prof. John Hay, ADB Consultant, presented the preliminary findings of the CEA for RMI. One opportunity for improved environmental performance is to enhance the certainty and quality of decision making, by Government, the private sector and by people. This would be assisted by and improved knowledge base, readily accessible by all parties, by ensuring laws and regulations are clear, and by ensuring there is clarity in the responsibilities, intentions, powers and procedures of Government. There is a need to foster additional constructive partnerships involving Government, the private sector and civil society. State of the art awareness raising programs are also required, to correct false perceptions, identify mutually beneficial opportunities and build mutual respect and confidence. This will lead to greater cooperation. Opportunities will also arise from increased responsiveness and accountability of Government, both National and Local. There is already considerable progress as a result of performance based budgeting. Benefits will come from more effective devolution of service delivery to Local Government and adoption of an adaptive management approach, given the highly dynamic nature of the RMI economy, society, and

environment. Increased community and Local Government participation in landuse planning, waste management, and building regulation would also bring substantial environmental and other benefits.

Benefits will also arise as a result of efforts to strengthen the enabling environment for sound environmental management and sustainable resource use. Relevant actions would include small and indirect business enterprise programs related to such activities as inshore fishing, agriculture and food processing, handicrafts and ecotourism, improved radio and telecommunications to provide early warning of impending disasters and environmental abuse, improved quality of transport services to and within the outer islands, energy substitution in the outer islands, based on copra fuel, and improved security of potable water supply and of management of solid waste and wastewater. Other opportunities are provided by building on ADB's strategic priorities for the RMI. These are enhanced public sector productivity, including improved access to basic social services, enhanced environment for private sector investment, job creation, and growth, and strengthened public sector governance. Recently ADB projects have been associated with reduced adverse environmental impacts and with growing and sustained, long-term environmental and social benefits.

With reference to constraints on improved environmental performance, it is usual to highlight shortages in funding, land and expertise and skills. However, the fundamental constraints relate to the fact that decision making, by all players, is often expedient, and not well informed. Decisions are often based on "what's best for me?" and "so long as I solve my problem, too bad if I create one for someone else". There are substantial, and growing, shortfalls in respect between Government and the people, leading to less cooperation. This is also a consequence of false perceptions regarding the intentions of Government, along with high levels of uncertainty – now and re the future.

In the discussion it was pointed out that in a society like RMI, people have other needs. Most people are struggling to meet other ends. Also, the problem is not identifying the issues, it is lack of implementation. If it is not possible to come up with some practical implementation plan, the problems will persist. More emphasis is needed on education and awareness, including a need to ensure the education system and curriculum are relevant to the RMI. The need for more education is one of consequences of non-compliance. A formal environmental education curriculum is currently being developed with coordination from MOE and other agencies. There is also a need for building the capacity of communities and Local Governments at the same time as revisions of EPA's regulations. EPA's attempts to achieve compliance have not been respected due to previous favored treatment.

It was also suggested that a master plan be prepared, covering all coastal areas experiencing rapid coastal erosion, with a study of the best design for construction of seawalls/or coastal protection, to assist future planning and construction.

### **'Priority Areas' and the Roadmap for ADB Interventions**

Ms Ellia Sablan-Zebedy, ADB Consultant, presented the proposed 'Priority Areas' and the Roadmap for ADB Interventions. In identifying the 'priority areas', the focus of the stakeholder consultations was not only on identifying environmental constraints which hinder development, but also on identifying areas where the environment and natural resources can provide new opportunities for economic development and social progress. By mainstreaming environmental considerations, whether they be constraints on, or opportunities for development, into development planning processes, the RMI will progress more quickly towards the end goal of achieving sustainable development.

Eight 'priority areas' for ADB interventions were described.

#### Priority Area 1: Improving Outer Island transportation

While there has been a significant effort on part of government to improve transportation services to the Outer Islands, problems continue to persist in the transportation sector. The production of copra - the main the source of income and employment for farmers in the Outer Islands - continues to decline, even after various Government initiatives to address the issue. Statistical data reveals that the fall in copra production from 5,256 short tons in 2001 to 2,653 short tons in 2002 was primarily due to non-lifting of copra from farmers in the Outer Islands.

The consequences of inaction include: a) increased financial burden and hardship on families to earn income to sustain livelihood; b) impact on education; c) impact on health; and d) places environmental constraints on some vulnerable resources such as certain types of fish stocks.

#### Priority Area 2: Developing copra oil as an alternative to diesel fuel in the Outer Islands

There is continued effort by both the government and the private sector to develop copra oil as an alternative to diesel fuel. However, little real progress has been made to date. Since last year, the prices of diesel fuel and gasoline have increased – in the case of gasoline from \$1.10 per gallon in 2000 to \$3.00 per gallon in 2005 on Majuro, and \$4.25 per gallon, or more, in the Outer Islands. For the Outer Islands the cost of diesel fuel has doubled, and in some cases tripled due to increased cost of freighting. Currently Tobolar produces and sells copra oil at \$1.99 per gallon. However, if the production of copra oil takes place in the Outer Islands, the cost of production will be much lower since copra need not be transported to Majuro. Labor costs will also be lower.

The consequences of inaction include: a) missing out on opportunities for employment, local development, and efficient use of the copra resource; b) adding further to the financial burden on families in the Outer Islands.

#### Priority Area 3: Combining traditional and modern approaches to land tenure, and to land use, and environmental planning legislation

The Government, with the assistance of ADB, has attempted to harmonize modern and traditional systems of land tenure and land use. Unfortunately, this has increased the perception that Government is attempting to take away control of land from traditional landowners. Since the inception of the Land Registration Authority, only four parties have registered their land titles. There is continued debate on the 'Dry-dock' issue. Various other Government development projects (e.g. schools, dispensaries) have stalled due to the lack of clear demarcation of who controls the use of land. This leads to overcrowding of homes and overfilled garbage bins leading to unsanitary living conditions and surroundings.

The consequences of inaction include: increases in social problems; environmental degradation of natural resources, i.e. contamination of groundwater and freshwater sources, leading to water borne diseases and other health complications.

#### Priority Area 4: Reducing risks to water quality and supply on Majuro and the Outer Islands

There has been some improved environmental performance in this area such as in the increased number and frequency of water quality testing by EPA. Furthermore, MEC plans to the construct a new water reservoir, thereby increasing storage capacity. But there has been a significant increase in the number of contaminated water sources. In 1999, 204 out of 2,261 water sources were contaminated. In comparison to 2003, 903 out of 3,633 water

source tested were found to be contaminated. The increase in contaminated water sources correlates to hospital statistics which indicate an increase in the number of patients infected with gastroenteritis, diarrhea, amobiasis and other water borne diseases.

The consequences of inaction include: increase in contaminated water sources; increase in people infected with water-borne diseases; increase financial burden on government, e.g. hospital costs; less productive people.

Priority Area 5: Disposing of solid waste in an environmentally sound manner, resulting in land reclamation

Various groups (NGOs, Local Government, CMI and National Government agencies), either working together or by themselves, are implementing a variety of solid waste management programs to combat solid waste issues. Even though MalGov ensures that garbage bins are collected weekly, there has been continuous overflow of garbage onto the ground. Moreover, numerous large rats have been sighted near these trash bins. Landfills are filling up quickly and continue to pose environmental and health risks to Majuro and Ebeye residents.

The consequences of inaction include: Pollution and degradation of shorelines and marine habitats in close proximity to landfills; contamination of groundwater; increased health problems; impact on livelihood for people utilizing near-shore resources.

Priority Area 6: Combining tradition and modern methods for coastal protection and erosion control

The enforcement of environmental and other regulations has so far been ineffective in curbing inappropriate dredging, sandmining, and development of coastal zones. This has contributed to the increased rate of coastal erosion, particularly in those areas with little or no erosion control. Current designs of landfills tend to aggravate coastal erosion as they tend to change wave patterns. There are virtually no trees around shorelines to protect the land. A lot of land has been lost through coastal erosion, e.g. picnic area in Laura.

The consequences of inaction include: growing population with less land area for development; contamination of groundwater due to intrusion of seawater; increase conflict between those who want to control the land.

Priority Area 7: Enhancing food security, especially in the Outer Islands

Government initiatives and programs have been developed to enhance and improve food security especially in the Outer Islands. However, these efforts have proven to be insufficient. There has been increasing dependence on imported food, particularly in the Outer Islands. Copra and other products, such as fish and shells, are exchanged for rice, flour and sugar. The dependency on imported food has also led to less re-planting and cultivation of food crops, e.g. pandanus, arrowroot. On some atolls, existing varieties of atoll food such as the pandanus have disappeared through lack of cultivation.

The consequences of inaction include: loss of traditional subsistence activities and skills; atolls more vulnerable to natural disasters, e.g. typhoons, pest-disease outbreaks; loss of food sources

Priority Area 8: Early warning systems for natural and other disasters (e.g. typhoons, tsunami, drought & disease)

Currently the Government utilizes the national radio station to alert and warn people about impending natural disasters, but this system is inoperative for much of the night. Moreover,

in the Outer Islands there are only two systems of SSB radio: one is used for health clinics and the other for schools. Currently there is one known proposal aimed at developing early warning radio systems for 10 atolls. No public awareness programs have been conducted to educate people on what to do during and after natural disasters. If early warning systems are adequate they will help minimize damage to the economy and the people.

The consequences of inaction include: Increase in vulnerability of Outer Islands populations; growing feeling of isolation; inability to inform Sea Patrol of illegal fishing and other activities.

A road map for the environment sector was presented and discussed.

### **Proposals for Mainstreaming Environmental Considerations in ADB's Country Strategy and Program for RMI**

Ms Ellia Sablan-Zebedy presented the proposals for mainstreaming environmental considerations in ADB's CSP for RMI.

These included three new technical assistance projects: (i) Building Capacity for Landuse Planning and Regulation of Building at Local Government Level; (ii) Harmonizing and Strengthening Traditional and Modern Methods for Coastal Protection and Erosion Control; and (iii) Enhancing Early Warning Systems for Natural and Other Disasters.

### **Discussion and Conclusions**

Discussion focused on a desire for the assistance provided by ADB to focus on implementation of on the ground activities, rather than on project preparation and assessments. Participants supported identification of the eight priority areas and encouraged early implementation of the road map for the environment sector. The proposals for mainstreaming environmental considerations in ADB's CSP for RMI were acceptable to participants, who again called for emphasis to be placed on implementation.

### **Closing Remarks**

Mr Bruce Bilimon, Office of International Development Assistance, Ministry of Finance, presented the closing remarks. He commended participants in the National Dialogue for their active fruitful involvement in the discussions and thanked those who had delivered the stimulating and informative presentations.

## Annex 1

### National Dialogue on Mainstreaming Environmental Considerations in Economic and Development Planning Processes in the Republic of Marshall Islands

**9:00 am to 4:45 pm, Thursday, April 28**  
**Venue: Nitijela Conference room, Capital Building**

#### Agenda

##### Morning Session

- 09:00 Opening Prayer
- 09:15 Opening Remarks (Hon. Witten Philippo, Minister in Assistance)
- 09:25 ADB Perspective on Environment and Development (Edy Brotoisworo, Asian Development Bank)
- 09:35 Why Mainstream Environmental Considerations? (Yumi Crisostomo, Director, OEPPC)
- 09:50 Purpose of Dialogue, Agenda, Dialogue Process (Ellia Sablan-Zebedy, ADB Consultant)
- 10:00 *Morning Tea*
- 10:30 The Environment – Opportunities and Constraints for Tourism (Delores dB Kattil, General Manager, MIVA)
- 10.50 Question & Answer
- 11:15 Opportunities for Improved Environmental Performance and Sustainable Development (John Bungitak, General Manager, EPA)
- 11.35 Question & Answer
- 12:00 *Lunch*

##### Afternoon Session

- 13:00 Key Findings in the Country Environmental Analysis (John Hay, ADB Consultant)
- 13:30 Discussion, and Validation of Findings
- 14:00 Proposed 'Priority Areas' and Roadmap for ADB Interventions (Ellia Sablan-Zebedy, ADB Consultant)
- 14:30 Discussion, and Consensus on Recommendations
- 15:00 *Afternoon Tea*

- 15:30 Proposals for Mainstreaming Environment in ADB's Country Strategy and Program for RMI (Ellia Sablan-Zebedy, ADB Consultant)
- 16:00 Discussion, and Consensus on Recommendations
- 16:30 Closing Remarks (Bruce Bilimon, OIDA, Ministry of Finance)
- 16:45 End of National Dialogue
- 17:00 Social Function at Marshall Islands Resort (Outside Jakaro Bar)

Facilitator: Yumi Crisostomo  
Rapporteur: Ellia Sablan-Zebedy



## Annex 2

### List of Participants

#### NATIONAL GOVERNMENT

Mr. Witten Philippo	Minister in Assistance to President, Office of President
Ms. Yumiko Crisostomo	Director, Office of Policy, Planning & Coordination
Ms. Deborah Barker	Deputy Director, Office of Policy, Planning & Coordination
Mr. John Bungitak	General Manager, Environmental Protection Agency
Ms. Lihla Noori	Environmental Protection Agency
Mr. Caleb McClennen	Environmental Protection Agency
Mr. Ted Z. Tarkon	Environmental Protection Agency
Mr. Jorelik Tibon	Ministry of Transportation & Communication
Mr. Alington Robert	Marshall Islands Water & Sewage Company
Ms. Dolores dB Kattil	General Manager, Marshall Islands Visitor's Bureau
Mr. Carl Hacker	Director, Economic, Policy, Planning & Statistics Office
Mr. Charles Paul	Chief, Economic, Policy, Planning & Statistics Office
Mr. Fredrick Muller	Secretary, Ministry of Resources & Development (R&D)
Ms. Tina Myazoe	Chief, Energy Division, Ministry of R&D
Mr. Robert Muller	Chief Secretary, Office of Chief Secretary
Mr. Clement Capelle	Disaster Management Office, Office of Chief Secretary
Ms. Biriam Stege	Secretary, Ministry of Education
Ms. Justina Langidrik	Secretary, Ministry of Health
Mr. Terry Keju	Marshall Islands Marine Resources Authority
Mr. Reginald White	Director, Weather Service Bureau
Mr. Bruce Bilimon	Chief of Overseas International Development Aid, Ministry of Finance

#### LOCAL GOVERNMENTS

Mr. Riley Albertter	Mayor, Majuro Atoll
Mr. Lenn Lenja	Mayor, Mili Atoll
Mr. James Matayoshi	Mayor, Rongelap Atoll
Mr. Melvin Majmeto	Mayor, Wotho Atoll

#### PRIVATE SECTOR

Mr. Jerry Kramer	Pacific International Inc.
Mr. Tony S. Phillips	Air Marshall Islands
Mr. Sultan Korean	Bank of Marshall Islands

#### NGOs

Ms. Marie Maddison	Women United Together in the Marshall Islands
Mr. Dennis Alessio	Waan Aelon in Majel (WAM)
Mr. Steve Why	Marshall Islands Conservation Society
Rev. Enja Enos	

#### Academia

Mr. Dean Jacobson	College of Marshall Islands
Mr. Don Hess	College of Marshall Islands

#### ADB

Mr. Edy Brotoisworo	Senior Environmental Specialist
Ms Ellia Sablan-Zebedy	Consultant
Prof. John E. Hay	Consultant

## Appendix 5

### Additional Information on Country Setting

Sound economic and development planning is critical to the RMI as it faces some of the most daunting development challenges of any country in the world. In common with its immediate neighbors, the Federated States of Micronesia and Kiribati, the RMI has a small population living on tiny atolls and islands scattered over an immense expanse of the central Pacific, with few accessible natural resources to sustain the population. This combination of limited accessible resources and vast distances results in high economic and development costs.

The very existence of the RMI is dependent on the continued health of ecosystems and uninterrupted functioning of the biological and oceanic processes that lead to atoll formation and modification. Atolls lie precariously on the tops of live coral reef systems. These highly dynamic landforms are created and survive as a result of coral rubble and animal exoskeletons washing up above the water line and providing fill. The islands become more stable when seeds of trees and other plants wash ashore and grow in ways that retain the soil and land around them.

Thus a high priority for economic and development planning in RMI is to ensure that there is minimal impact on the natural ecosystems and oceanic processes that sustain the fragile atoll- and island-associated marine systems. This means not only sustainable harvesting of living resources and extraction of non-living resources, but also ensuring that the discharges of wastes to land, sea and the air are at a rate, and of a form, that is well within the assimilative capacity of the environment. Regrettably in recent decades neither of these requirements has been met. Environmental quality has declined, many living terrestrial and marine resources have been depleted, and there has been unsustainable and environmentally unsound extraction of non-living resources.

The vulnerability and degraded quality of RMI's environment and natural resources clearly places constraints on economic, social and cultural activities. But these assets also provide important opportunities for economic development and social progress, including poverty alleviation. The challenge is to use these assets in an efficient and sustainable manner.

Sustainability in economic and environmental management involves reconciling the present and future needs of the interlinked natural, social and economic systems. For RMI it is critically important to restore integrity to the damaged natural ecosystems, and to develop effective responses to new threats and changing circumstances, particularly climate variability and change. Sustainability of the nation also involves: (i) the security of income, skills and outside support; (ii) the efficiency with which RMI converts inputs to outputs; and (iii) the social, inter-island and inter-generational equity of distribution of the costs and benefits of that process.

Despite having one of the highest per capita gross domestic products (GDP) among the Pacific DMCs, the RMI has some of the worst social indicators. Among other things, infectious and lifestyle diseases are at close to epidemic proportions, the rate of infant and child mortality is high albeit improving slowly, teenage pregnancies are increasing, alcohol and tobacco use are high, and the rate of suicide is alarming. A lack of employment opportunities is leading to a sense of futility and is eroding people's selfworth.

In recent years poverty and hardship appear to have worsened in RMI, in both urban and rural areas. The United Nations Development Programme (UNDP) 1999 *Pacific Human Development Report* ranked RMI 9th (down from 4th in 1994) among the 14 Pacific developing member countries (DMCs), with a human development index (HDI) of 0.563. The RMI also ranked 9th in terms of poverty, with a human poverty index (HPI) of 19.5. In 1999

an estimated 20% of all households fell below the international poverty benchmark of \$1-a-day.

Declining social conditions, including environmental hazards related to poor housing and waste disposal, as well as weakening social organization in the expanding urban centers of Majuro and Kwajalein Atolls, are evident. Other pressing environmental concerns are the quality and security of supply of drinking water and accelerated rates of coastal erosion. RMI is highly vulnerable to extreme climatic events and to sea-level rise. These can have an adverse impact on socioeconomic development, with resources diverted to support emergency response and disaster rehabilitation. Future changes in climate will likely worsen social and economic conditions and increase social and economic costs, particularly in climate-sensitive sectors such as water and sanitation, infrastructure and access to inshore marine resources.

Traditional and modern structures of authority uneasily coexist in the RMI. Overlap and tension between them are inevitable, and lead to lack of coordination, under-performance and litigation. The Constitution tries to address the problem by recognizing traditional ranks and interests in land, but in so doing hampers the natural evolution of these concepts under modernizing influences. RMI's post-war colonial experience and ready access to Compact funding since independence encouraged the neglect of asset maintenance in favor of asset replacement. Government-owned buildings, equipment, vehicles and ships were allowed to decay into an unserviceable condition. A related mind-set has allowed the deterioration of the natural environment, particularly in urban areas. There is no effective public environmental education program, local and national government laws on waste, nuisance, land use and environmental protection result in few environmental benefits, and the RMI Environmental Protection Agency (EPA) lacks many of the resources needed if it is to take corrective action.

Ever since first contact with Europe, creeping monetization in the RMI has been creating financial inequity. For the first hundred years of the colonial period this did not matter too much. The population of RMI remained below 12,000 and most people were still based on the land. In the last fifty years much has changed. The population has increased over four-fold and more than two-thirds of the people are living in urban centers. The economy has become highly monetized and great disparities of income, wealth and welfare have emerged. The sharpest costs of development—landlessness, overcrowding, poor education and health, joblessness and a slide into prostitution and petty crime—fall on the poorer urban people (and among them, with particular force upon women and children), while rural dwellers are deprived of economic opportunity. The benefits of development - commercial opportunities, good houses, overseas vacations, access to good schools and hospitals, financial security—go mainly to the already well off.

There is a need to consider what sustainability means in the Marshall Islands context: which systems and relationships should be deliberately sustained and how, and which should be allowed or encouraged to evolve or disappear. The systems and relationships at stake range from the ecology of land, lagoon and ocean, through to the formal and informal procedures and relationships that control and direct people's lives, such as the land tenure system and the traditional authority structure.

#### A. Natural Resources

The environment is almost marine. Most of the plants and animals that thrive in the country are semi-marine or dependant on or associated with the ocean. Aside from the occasional shore birds (the endemic Ratak Micronesian pigeon) and the great variety of the seabirds crabs such as the coconut and hermit crabs prosper in this environment.

The terrestrial environment contains a variety of flora which are mostly salt tolerant. For instance, the *Scaevola taccada* which is more tolerant to salt spray can be found right on windward areas of atolls facing ocean beaches. Right after the salt tolerant plant species growing in abundance are forest trees comprising mostly of *pisonia grandis*. Growing more inland are the food crops such as breadfruits, bananas, taro, pandanus and so forth.

A diverse array of coral species occurs in the Marshall Islands. However, the marine diversity is not limited to corals, in fact many other species can be found in coral structures, burrowing in sands or nearshore areas. Some of these marine species include turtle, starfish, sea cucumbers, shrimps, lobsters, crabs, worms, sponges, clams, oysters, mussels and gastropods. Most species are utilized for food and some such as seashells are used for handicrafts and jewelry.

Most of the habitats of marine species have not been disturbed. However, this is only in the outer islands. In the urban centers, such as in Majuro, Ebeye and in some areas of Jaluit, the marine species and habitats are overexploited and degrading. A factor which contributes to environmental degradation of marine species in nearshore areas is mostly derived from human activities such as dredging, sandblasting of coral reefs and the collection of coral rocks and sands which are utilized for construction purposes

## B. Agriculture

Agricultural production is relatively small in the Marshall Islands, however, it is significant to the livelihood of people and the economy. Agricultural production is limited to copra– the main cash crop– and the recently introduced *noni* products. Other significant food crops include banana, lime, breadfruit, arrowroot, pandanus, pumpkin, and papaya. Livestock exists however these are limited to poultry and pork farming. These food crops and livestock are mainly produced for subsistence.

The limitation of agricultural production is due to not only the relatively small land area; the total land area for the Marshall Islands is only 70 square miles but also due to the fact that more than 50 per cent of the land is not suitable for agricultural crops. The atoll soils are derived from coral rocks and sand and thus are very poor in nutrients and unsuitable for growing crops. In Majuro Atoll, however, there has been success in growing vegetables, root crops and fruits at small commercial scale at the Laura Farm. The farm is operated by Taiwanese technical assistance.

From 1997 to 2001, the agriculture sector's contribution to the GDP was from 6.8 to 6.3 per cent. However, in the pre-WWII years, copra production was as high as 32,000 tons per year. The decline in production was due to the fall in world price for copra and irregular field trip services to the outer islands. Most of the copra produced comes from in the outer islands. Copra production on average ranges from 4,000 to 7,000 short tons per year. The 7,201 short tons produced in 1995 was the highest production in nearly 50 years. Copra production in 2001 at 2,653 short tons was the lowest and this was primarily due to non-lifting of copra from farmers in the outer islands. Currently, the most significant factor affecting copra production is the availability and regularity of domestic shipping services or field trips to the outer islands which has declined sharply over the years. Field trip services to the atolls were once a month, however, due to increase in the price of fuel, services were reduced to once every two months.

Over the past 20 years, the production of copra has declined dramatically (Figure 1). The decline in copra production is due to the continued depressed price of copra in world markets, reduced productivity of aging coconut palms, and inadequate storage and shipping services in the Outer Islands. It is estimated that 60% of palms are over 60 years old

(coconuts have an economic life of about 80 years) while approximately one-third of trees are non-bearing (United States Army Civil Affairs, 2003).

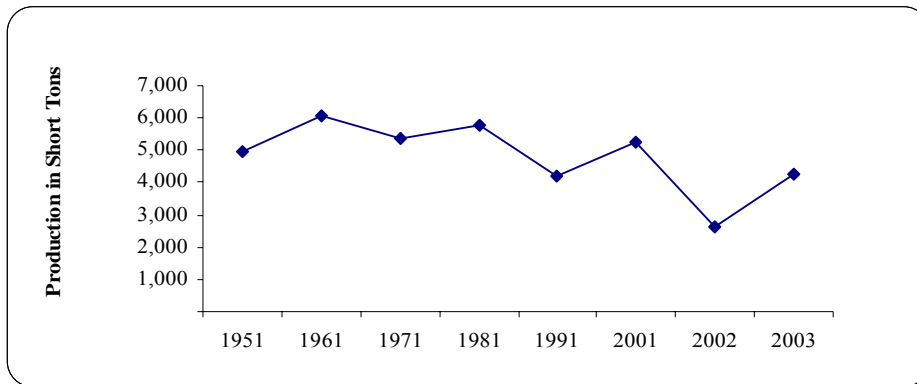


Figure 1. Copra production in RMI, 1951 to 2003 (From RMI Statistical Yearbook, 2003)

The fall in copra production from 5,256 short tons in 2001 to 2,653 short tons in 2002 was primarily due to non-lifting of copra from farmers in the Outer Islands. Consultations conducted on Jaluit Atoll highlighted these problems (see Appendix 3). Copra producers noted that there were fewer field trips, the ship was often already full when it arrived at Jabor, and often by then there were no empty copra sacks available to exchange for full sacks of copra. This disproportionate impact on Jaluit is indicated in Figure 2.

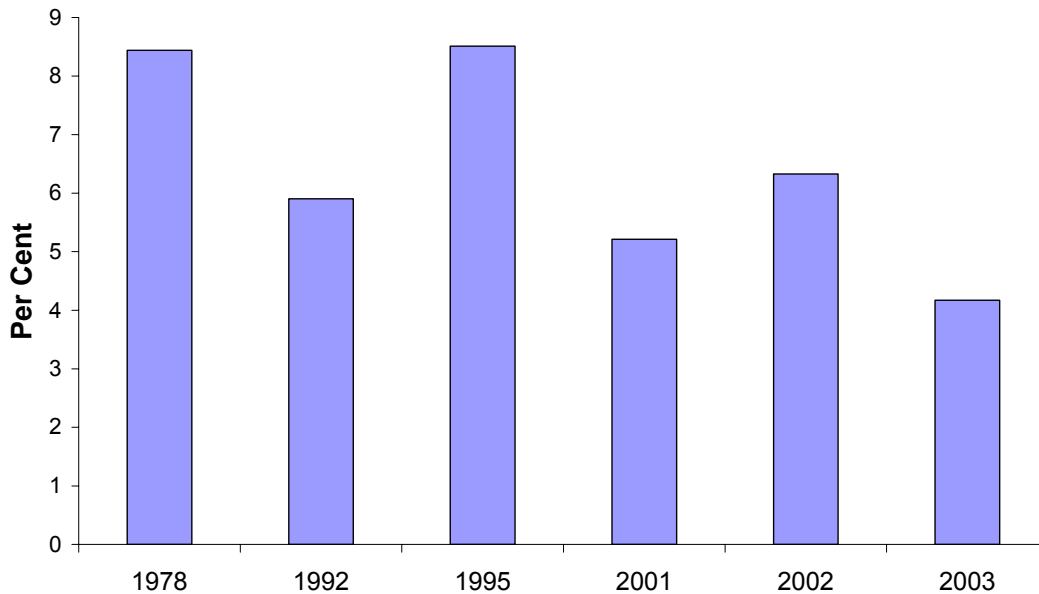


Figure 2. Copra production for Jaluit Atoll as percentage of national copra production, 1978, 1992, 1995 and 2001 – 2003. (Based on RMI Statistical Yearbook, 2003)

However, in 2003 copra production increased to slightly less than 5 short tons. This increased copra production was due to a Government initiative to improve field trips to the Outer Islands. The intention was for local private enterprises to operate the ships, with Government providing subsidies for at least two years, until the private enterprises were capable of sustaining the field trip operations. Regrettably, the Government initiative was unsuccessful because the private operators were unable to sustain operations and continued to seek increased subsidies.

As a result of the decline in copra price, more and more people in the Outer Islands are seeking other sources of income-generation. Recently this is evident in the increased production of handicrafts and harvesting of near-shore marine resources, especially fish. This shift is due to higher incomes derived from the sales of handicrafts and marine resources and easier transport of such products to markets in the urban centers.

Food crops (principally banana, breadfruit, taro, sweet potato, arrowroot, pandanus, and lime) are produced mostly for domestic consumption in urban centers, and for subsistence use in the Outer Islands. In the Outer Islands food crops are frequently shared or exchanged for other food supplies.

But production of food crops has also declined. This is mainly in response to the increased access and hence ability to purchase imported food staples such as rice, sugar and flour, together with their relative convenience in terms of preparation time and storage.

#### C. Fisheries and Coastal Resources

Among the productive sectors, fisheries is the most significant and also the key export sector. In this sector, there are two sub-sectors namely the coastal and oceanic with the oceanic sector generating foreign exchange earnings and adding value to national Gross Domestic Product. In comparison, while the coastal fisheries has potential to generate significant foreign exchange income its products are consumed domestically.

With over 2 million square miles of ocean, the Exclusive Economic Zone (EEZ) of the Marshall Islands supports a significant tuna resource. The Forum Fisheries Agency estimates the value of annual tuna catch to be over US\$50 million. Most of the earnings generated in this sub-sector derive from direct, i.e. access and license fees and indirect earnings, i.e. the sell of fuel, provisions, and food to fishing vessels. Currently, the license fees are charged at the rate of 5 per cent of landed value catch. From 1997 to 2001, the sub-sector's contribution to GDP ranges from 3.6 per cent to 7.3 per cent per annum. One major factor affecting the annual catch of tuna is adverse climatic conditions – El Nino – higher tuna catch and La-Nina – lower tuna catch. Another factor is the rate and volume of catches, with yellowfin and bigeye tuna nearing over-exploitation.

Since all of the tuna caught in RMI waters is exported overseas for processing, a value-added initiative by the national government encouraged the development of a tuna loining plant on Majuro Atoll. The plant provided employment for over 400 Marshallese of whom 80 per cent were women. Currently, the loining plant has since closed down.

A number of projects were also carried out by the Marshall Islands Marine Resources Authority (MIMRA) to develop RMI's coastal resources. A giant clam farm was established in Loto, Likiep Atoll in 1990 with the objective of marketing aquaculture baby giant clams to oversea markets and also to re-seed sites in the outer islands. This project still continues.

Several pearl farms were initiated in conjunction with MIMRA and private enterprises. Two pilot projects were conducted on Namdrik and Majuro by Black Pearl Inc., a Hawaiian-based company, and MIMRA. Unfortunately, these projects were unsuccessful. Another pearl farm

was established by a local company, Robert Reimers Enterprises (RRE) and still continues to date.

Another project involved the Japanese ODA in establishing outer island fisheries fishbase in Mili, Aur, Likiep, Ailinglaplap, Ebeye, Namu and Arno. The project purchased fish from local fishers and sells them at a reasonable price to retail markets in Majuro and Ebeye. Through a Japanese technical assistance, a survey was carried out and revealed that the rabbit fish stock in Arno Atoll is declining due to overfishing.

MIMRA has been involved in development coastal and marine resource plans. The first is a community-base fisheries program comprising of comprising of Marshall Islands Marine Resources Authority, Marshall Islands Visitor Authority, Environment Protection Agency, Ministry of Internal Affairs, and College of the Marshall Islands. The aim of the program is to build the capacities of local government and councils to manage and conserve the marine resources and environment of local communities within the five miles zones of respective atolls. MIMRA also concluded the development of a shark management plan.

In 2002-03 the economy based on the oceanic fishery experienced a downturn (Figure 3). There was a decrease in the number of trans-shipments occurring in Majuro Atoll, and also fewer fish were caught in RMI waters. In 2001-02, MIMRA received about \$3.66 million in license fees, higher than in 2002-03 when they collected only \$2.31 million (Figure 4). It also contributed to the closure of the tuna loining plant, with a loss of some 530 jobs, 80% of which were occupied by females (Figure 5).The downturn is attributed to the end of El Niño conditions, resulting in the principal tuna stock moving out of RMI waters and congregating more in the Western hemisphere around Papua New Guinea and its neighboring countries. This leads to decreased catch and less trans-shipments occurring in the RMI.

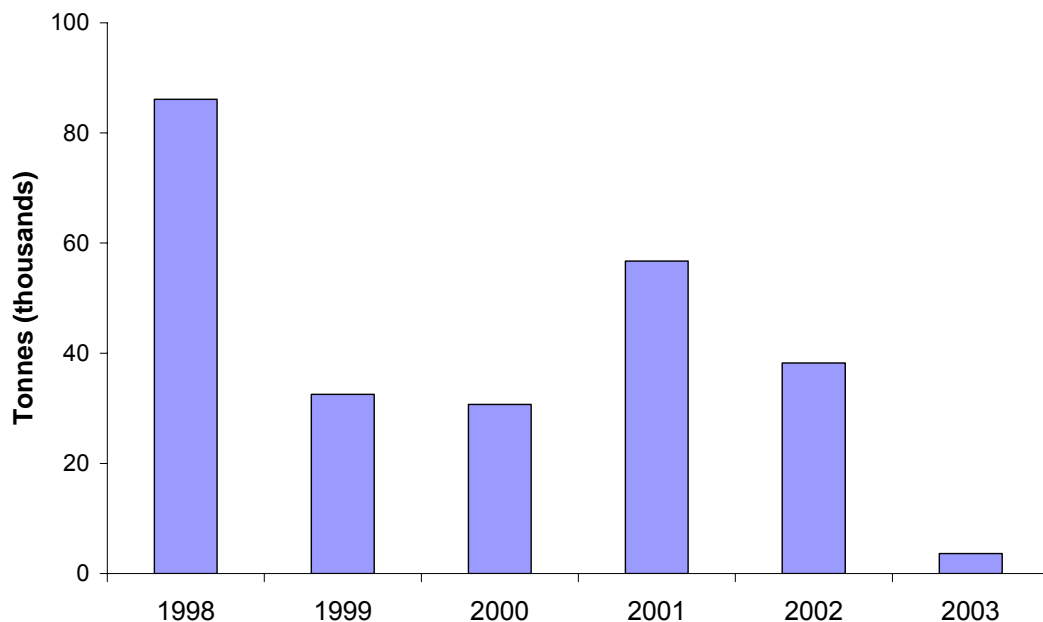


Figure 3. Total fish catch in RMI EEZ, 1998 to 2003 (From RMI Statistical Yearbook, 2003)

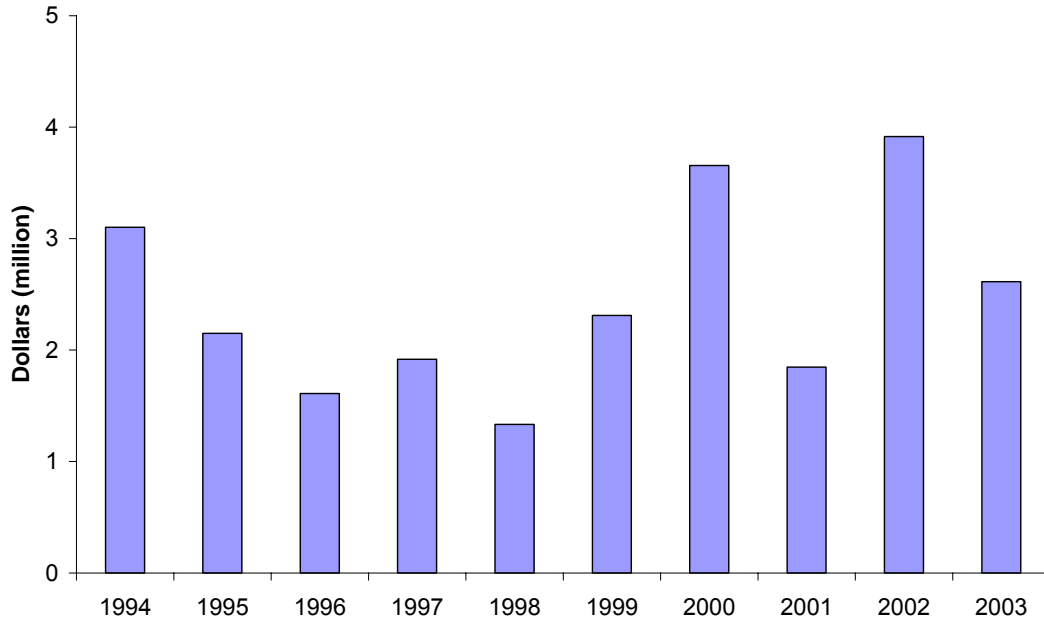


Figure 4. Income (\$ million) from fishing rights (From RMI Statistical Yearbook, 2003; MIMRA Annual Reports 2001/02 and 2002/03)

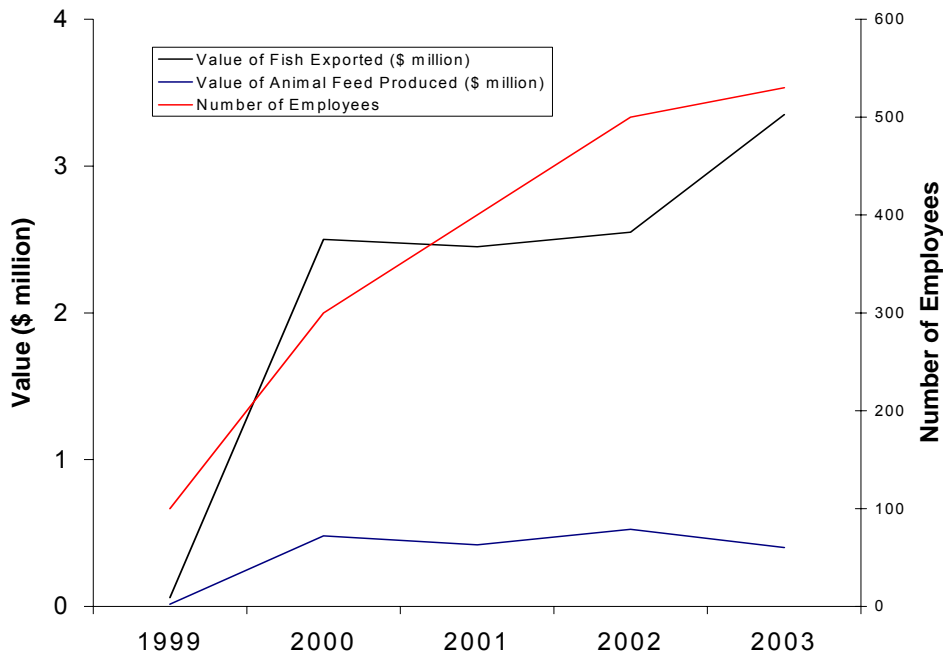


Figure 5. Tuna loining plant - value of production and number of employees. (From RMI Statistical Yearbook, 2003)



The tuna fishery is dominated by the purse-seine fishery. While there was significant Japanese pole-and-line fishery, this number has declined. There is also a significant longline fishery operating in the EEZ and the number of vessels had remained approximately the same. The total number of licensed fishing vessels in the RMI has declined from 316 in 2001-02 to 258 in 2002-03. This has impacted the revenue and economic spin-offs for the RMI from the oceanic fishery.

#### D. Groundwater Resources

Natural ground water is limited to the wider land formations. On Majuro atoll, there are several ground water lenses with most of it concentrated in Laura. The seven ground water lens in Laura utilizes a system of seven wells that tap the freshwater nucleus of the water lens. The Majuro Water & Sewage Company at times pumps water from the wells to their treatment plant station and then into the water distribution lines. The production of the Laura lens depends on the recharge of the lens with rainfall.

For the outer islands, many homes tap into the groundwater lens, however the water supply service level is still considered inadequate. Most homes would supplement their water supply by constructing water catchments.

Islet	Atoll	Percent of homes w/freshwater wells	Water Supply Service Level	Drought Vulnerability
Jabor	Jaluit	0.0	Inadequate	Moderate
Jaluit	Jaluit	10.4	Poor	High
Imroj	Jaluit	13.1	Extremely poor	Extremely vulnerable
Taroa	Maloelap	70.0	Inadequate	High
Airok	Maloelap	74.2	Inadequate	High
Jang	Wotje	70.0	Poor	Extremely vulnerable
Wotje	Wotje	78.8	Poor	High
Wormej	Wotje	41.2	Poor	Moderate
Majkin	Namu	54.6	Poor	Moderate
Namu	Namu	25.4	Inadequate	Moderate
Mae	Namu	6.6	Poor	High
Airuk	Ailinglaplap	5.4	Poor	Extremely vulnerable
Buoj	Ailinglaplap	10.0	Poor	Moderate
Woja	Ailinglaplap	26.8	Poor	Extremely vulnerable
Ebon	Ebon	70.0	Inadequate	Low
Toka	Ebon	83.0	Inadequate	Low
Lae	Lae	65.0	Critical	Extremely vulnerable
Ujae	Ujae	100.0	Inadequate	Moderate
Mejit	Mejit	33.6	Poor	Moderate
Rong rong	Majuro	67.0	Poor	Moderate

Source: Final Report on Water Resources Evaluation and Proposed Water Development Plan for ten atolls in the Marshall Islands. 2000. Ministry of Resources and Development and US FEMA, Region IX

In the outer islands, especially those atolls with small land formations (no groundwater lens), communities collect water solely with residential rooftop catchments. On Jabor, the center of Jaluit Atoll, there is no groundwater lens so the community collects water from rooftops. However, when the Water Quality personnel from the Environmental Protection Agency (EPA) tested the water in the catchments, they found that 90 per cent of catchments were contaminated. Many residents had planted trees nearby to help provide shade which cools the homes and also buffer residential homes from ocean salt sprays. However, without collars, the trees provide easy access for animals on rooftops.

#### E. Biodiversity Resources

The Republic of the Marshall Islands' Biodiversity Strategy and Action Plan (RMI-BSAP) developed in 1997 and endorsed in 2000 presents the state of the country's biodiversity and outlines approaches to conservation. While many of species have been introduced, there are a few that are endemic to the Marshall Islands. Among thousands of flora and fauna, only 49 species, 6 sub-species and 2 varieties are endemic. Of these, 54 are animals mostly marine species and the rest are plants.

For thousands of years, Marshallese has developed a strong bond with the sea and its many biodiversity resources. For this reason, the biodiversity goals that were identified during the development of the RMI BSAP focused on a) conservation of biodiversity and biological resources, b) protection of the marine environment, c) revival and public awareness of traditional culture and practices, d) people and biodiversity, e) biotechnology and biodiversity, and f) biosafety and biodiversity.

#### F. Mineral Resources

The mining of mineral resources have not taken place yet in the country despite the fact that studies have revealed deposits of manganese, cobalt, nickel and platinum exists in seamounts and the ocean floor. These may ultimately be commercially exploitable depending on the development of cost-efficient mining techniques.

The other type of mining that takes places particularly in the urban centers is the mining and quarrying of coral rocks and sands for construction and building purposes.

#### G. Water and Sewage Services

Although there are groundwater lens particularly on those atolls or islands with wider land formations, the country heavily relies on rainfall for its water supply. In Majuro atoll, water is supplied by the Marshall Islands Water & Sewage Company (MWSC). On Ebeye atoll, there are two reverse osmosis machines with capacities of 100 gallons per day that supply water to the community. However, for most communities throughout the nation, they rely on roof catchments and wells for their water.

In Majuro, in addition to the Laura groundwater lens, the water is also collected from runoffs from both sides of the 7,900 feet runway at the Amata Kabua International Airport. This runway catchment can accumulate up to 3-4 million gallons of rainwater per day. The raw water from both sources, the airport runway and Laura ground water lens, are treated and then transferred to the six reservoirs which has a total capacity of 36 million gallons. The water treatment plant filters out sand and chlorinates the water as needed. Furthermore, it also monitors the salt content of the raw water.

Despite relatively high rainfall occurring in most of the country, there continues to be water shortage. Currently, water availability to Majuro residents is about 26 gallons per person per day and for Ebeye residents 24 gallons per person per day. Unrestricted demand for water

for the nation has been estimated at 45 gallons per person per day. However, due to limited supply of water and increasing population particularly on Majuro Atoll, the MWSC has rationed water and restricted the supply of water to 8 hours a day on Mondays, Wednesdays, and Fridays only.

On Majuro, most properties between “the bridge” and Rita are connected to the sewer. The exceptions are the larger hotels and businesses such as Robert Reimers Enterprises, the Marshall Islands Resort (formerly the Outrigger Resort) and Payless Store (formerly Gibson’s), which have their own water catchment/treatment systems. These large buildings are capable of gathering about 50,000 gallons off their roofs.

Salt water is also made available to both residents of Majuro and Ebeye and it is used mainly for flushing toilets.

In 1999 39% of homes in the RMI had an inside flush toilet, while 23% had an outside flush toilet. Other homes had water sealed toilets inside (4%) or outside (9%), a pit latrine (6%) or no toilet facilities (19%).

**Appendix 6**  
**Environmental and Sustainability Indicators**  
**Country Environment Indicators**

Item	1990	Current
<b>1. Energy Efficiency of Emissions</b>		
Traditional Fuel Use (% of total energy use)	—	—
<b>2. Water Pollution</b>		
Water Bodies Exceeding Contact Recreation Standards	—	—
Biological Oxygen Demand (BOD)	—	—
Chemical Oxygen Demand (COD)	—	—
<b>3. Air Pollution</b>		
Carbon Dioxide (CO <sub>2</sub> ) Emissions Total (millions of metric tons)	—	—
		0.036 (2003)
Per unit of GDP (kg/PPP\$ GDP)	—	—
Sulfur Dioxide (SO <sub>2</sub> ) Emissions Per capita (kg)	—	—
<b>4. Land Use and Deforestation</b>		
Total Land Area (km <sup>2</sup> )	181.0	181.0
Average Annual Deforestation Area (remaining km <sup>2</sup> )	—	—
% change	—	—
Arable Land (% of total land)	0.0	16.7
	(1993)	(1998)
Cropland, Permanent (% of total land)	60.0	0.0
	(1993)	(1998)
Pastures, Permanent (% of total land)	0.0	—
	(1993)	
Population Density, Rural (people per square mile)	233.0	246.0
	(1988)	(1999)
<b>5. Biodiversity and Protected Areas</b>		
Nationally Protected Area(s) Area (km <sup>2</sup> )	—	11.3
		(1998)
Number	—	1
		(1998)
World Heritage Sites (number)	—	—
Mammals (number of threatened species)	—	1
		(2002)
Birds (number of threatened species)	2	1
	(1987)	(2002)
<b>6. Urban Areas</b>		
Urban Population		
% of total population	65.0	65.2
	(1988)	(1999)
Per Capita Water Use (liters/day)		70
		(2003 est)
		170.3
	—	Unlimited demand
		(2003)
Majuro (liters/day)		98.4

Ebeye (liters/day)		actual (2003) 90.8
Wastewater Treated (%)	—	actual (2003)
Solid Waste Generated per Capita (kg/day)	—	0.5 (Jenrok village (2004))

— = data not available, GDP = gross domestic product, kg = kilogram, km<sup>2</sup> = square kilometer, PPP = purchasing power parity.

Source:

### Country Social Indicators

Item	1990	1995	Latest Year
<b>1. Demographic Indicators</b>			
Total Population ('000)	44.0	47.5	58.8 (2003 est)
Annual Population Growth Rate (% change)	1.5	1.5	3.9
Dependency ratio (% of dependents to working age)	117.0 (1988)	82.2 (1999)	77.9 (2002 est)
Total Fertility Rate (births per woman)	7.0	6.4	5.5 (2002)
Ave. Household Size	8.7 (1988)	—	7.8 (1999)
Urban	—	—	8.1
Outer Islands	—	—	7.4
<b>2. Health</b>			
Life Expectancy at birth (years)	61.6 (1988)	67.5 (1999)	62.7 (2002)
Male	60.0	65.7	61.1
Female	62.5	69.4	64.6
Population with access to health services (%)	—	95.0 (1995/97)	—
Population per doctor	—	2,735 (1995/97)	1770 (2002)
Government Expenditure on Health			
As % of total government spending	—	12.5 (1994/95 – 1999/00)	10.8 (2000/01) 8.0 (2001/02)
As % of GDP	—	4.0 (1999)	5.8 (2000/01)
<b>3. Education</b>			
Adult Literacy Rate (%)	74.4 (1988)	98.3 (1999)	91.0 (2001)
Male	79.0	98.3	
Female	69.0	98.4	
Combined Gross School Enrollment Ratio	94.1 (1993/94)	86.3 (1995/96)	81.7 (2000/01)
Male	—	—	—
Female	—	—	—

Gross Primary Enrollment (% of aged 5 -14 yrs)	117.3 (1993/94)	108.9 (1995/96)	105.0 (2000/01)
Male	—	—	—
Female	—	—	—
Gross Secondary Enrollment (% of aged 15 – 19 yrs)	46.1 (1993/94)	42.8 (1995/96)	47.1 (2000/01)
Male	—	—	—
Female	—	—	—
Student/Teacher Ratio (no. of students per teacher)			
Primary	22.7 (1990/91)	20.0 (1995/96)	17.2 (2000/01)
Secondary	13.7 (1990/91)	16.5 (1995/96)	17.7 (2000/01)

Item	1990	1995	2000	Latest Year
Government Expenditure on Education				
As % of Total Government Spending	—	21.5 (1994/95)	21.0 (2000/01)	17.8 (2004)
		— 1999/00)		
As % of GDP	—	16.9 (1998/99)	11.3 (2000/01)	

□ not available, ADB = Asian Development Bank, GDP = gross domestic product.

<sup>a</sup> Estimates from *Asian Development Outlook 2004* population database.

<sup>b</sup> Ministry of Health, Health Profile of the Marshall Islands 2002.

<sup>c</sup> Secretariat of the Pacific Community (SPC), Pacific Regional Information System (PRISM), available: <http://www.spc.int/PRISM>.

<sup>d</sup>

World Health Organization (WHO), *The World Health Report 2003*.<sup>e</sup> WHO, Western Pacific Region Health Data Bank (rev/2001), available: <http://wpro.who.int>.<sup>f</sup> United Nations Development Programme (UNDP), *Pacific Human Development Report 1999*; UNDP, *Human Development Report 2003*.<sup>g</sup> Office of Planning and Statistics, Republic of the Marshall Islands, *Social Statistics Bulletin* (June 2002), Table 9.10 and Table 9.11.<sup>h</sup> United Nations Educational, Scientific and Cultural Organization (UNESCO), Institute for Statistics, available: <http://portal.unesco.org/uis>. Sources: Unless otherwise specified, data are from ADB's TA 6002-REG discussion papers (December 2002) which are primarily based on the household income and expenditure surveys (1994 and 2002) and the national censuses (1988 and 1999).

### Progress Toward the Millennium Development Goals and Targets

Goals and Targets	1990	1995	Latest Year
<b>Goal 1 Eradicate Extreme Poverty and Hunger</b>			
<b>Target 1: Reduce incidence of extreme poverty by half from 1990 to 2015</b>			
1. Proportion of population below \$1 per day (PPP values)			
Total	—	—	20.0 (1999)
Outer Islands (Rural)	—	—	65.0 (1999)

2. Poverty gap ratio	—	—	—
3. Share of poorest quintile in national consumption (%)	—	—	<5.0 (1999)

**Target 2: Reduce the proportion of people who suffer from hunger by half from 1990 to 2015**

4. Prevalence of child malnutrition (% of children under 5)	19.0 (1991)	—	27.0 (1997)
5. Proportion of population below minimum level of dietary energy consumption (%)	—	—	—

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**Goal 2: Achieve Universal Primary Education**

**Target 3: Attain 10% primary school enrollment by 2015**

6. Net enrollment ration in: (%)				
Primary education	81.9 (1989)	95.0 (1994)	84.1 (1999)	82.5 (2003)
Secondary education	46.7 (1989)	—	69.5 (1999)	—
7. Proportion of pupils starting Grade 1 who reach Grade 5	—	—	—	—
8. Literacy rate of 15-24 year olds (5)	68.6	72.2	76.9 (2002)	

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**Goal 3: Promote Gender Equality and Empower Women**

**Target 4: Eliminate gender disparities in primary and secondary education by 2005 and at all levels of education no later than 2015**

9. Ratio of girls to boys in: (%)				
Primary education	—	93.0 (1998)	97.0 (1999)	
Secondary education	—	—	97.0 (1999)	
10. Ration of young literate females to males (% of age group 15-24)	—	—	1.0 (1999)	
11. Share of women in wage employment in the nonagriculture sector	—	—	31.0 (1999)	
12. Proportion of seats held by women in national parliament	3.0 (1991)	3.0 (1999)	3.0 (2001/03)	1.0 (2005)

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**Goal 4: Reduce Child Mortality**

**Target 5: Reduce infant and child mortality by two thirds from 1990 to 2015**

13. Under -5 mortality rate (per '000 live births)	92.0	81.0	48.0 (1999)	66.0 (2002)
14. Infant mortality rate (per '000 live births)	63.0	59.0	37.0 (1999)	54.0 (2002) 23.0 (2004)
15. Proportion of 1 year old children immunized against measles	67.0	70.0 (1998)	80.0 (2002)	

<b>Goal 5: Improve Maternal Health</b>				
<b>Target 6: Reduce maternal mortality ratio by three-quarters between 1990 and 2015</b>				
16. Maternal mortality ration (per 100,000 live births)	—	0.0 (1996)	0.0 (1998)	
17. Births attended by skilled health staff (% of live births)	—	94.8 (1998)	95.0 (1995/02)	
<b>Goal 6: Combat HIV/AIDS, Malaria and Other Diseases</b>				
<b>Target 7: Have halted by 2015, and begun to reverse, the spread of HIV/AIDS</b>				
18. HIV prevalence rate among 15-24 year old pregnant women	0.0	0.0	0.0 (2001)	15 (2004)
19. Contraceptive prevalence rate (% of women aged 15-49)	—	25.2 (1996)	36.9 (2000)	
20. Number of children orphaned by HIV/AIDS	—	—	—	
<b>Target 8: Have halted by 2015, and begun to reverse, the incidence of malaria and other major diseases</b>				
21. Malaria:				
Prevalence rate (per 100,000 people)	—	—	—	
Death rate (per 100,000 people)	—	—	15.0 (2000)	
22. Proportion of population in malaria risk areas using effective malaria prevention and treatment measures	—	—	—	
23. Tuberculosis:				
Prevalence rate (per 100,000 people)	—	107.3	133.7 (2001)	
Death rate (per 100,000 people)	—	—	3.0 (2001)	
24. Proportion of tuberculosis cases detected and cured under DOTS (%)	—	—	71.0 (2000)	82.0 (2001)
<b>Goal 7: Ensure Environmental Sustainability</b>				
<b>Target 9: Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources</b>				
25. Forest area (% of total land area)	0.0	0.0	0.0	
26. Nationally protected areas (% of total land area)	—	—	0.0 (2003)	
27. GDP per unit of energy use (PPP \$ per kg oil equivalent)	—	—	—	
28. Carbon dioxide emissions (per capital metric tons)	—	—	—	
<b>Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water</b>				



29. Access to an improved water source (% of population)	—	82.0 (1997)	90.1 (1999)
<b>Target 11: By 2010, to have achieved a significant improvement in the lives of at least 100 million slum dwellers</b>			
30. Access to improved sanitation (% of population)			
Total	—	77.0 (1997)	75.6 (1999)
Urban	—	—	90.3 (1999)
Rural/Outer Islands	—	—	42.3 (1999)
31. Access to secure tenure (% of population)	—	—	—

## Appendix 7

### Additional Information on Frameworks and Environmental Performance

#### Legal Framework of the RMI

##### a. National

The "**National Environmental Protection Act 1984**" establishes the National Environmental Protection Authority, the primary purpose of which is to preserve and improve the quality of the environment, and more specifically to:

- (1.) study the impact of human activity including population growth and redistribution, cultural change, exploitation of resources and technological advances on the environment;
- (2.) restore and maintain the quality of the environment;
- (3.) use all practicable means including financial and technical assistance to foster and promote the general welfare of the people by creating conditions under which mankind and nature can coexist in productive harmony;
- (4.) improve and coordinate consistently with other essential considerations of national policy, governmental plans, functions, and programs and resources, so as to prevent, as far as practicable, any degradation or impairment of the environment;
- (5.) regulate individual and collective human activity in such manner as will ensure to the people safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- (6.) attain the widest possible range of beneficial uses of the environment without degradation or impairment thereof and other undesirable consequences to the health and safety of the people; and
- (7.) preserve important historical, cultural and natural aspects of the nation's culture and heritage, maintaining at the same time an environment which supports multiplicity and variety of individual choice.

The Authority may make regulations with respect to primary drinking water, secondary drinking water, pollutants, use or application of pesticides, fungicides, insecticides, rodenticides and other chemicals which have a deleterious or harmful effect on the environment or any aspect thereof or human health and safety, discharge of hazardous waste, preservation of important historical, cultural and natural aspects of the nation's heritage, and other aspects of the environment which, in the opinion of the Authority, require regulation.

The Authority is required to formulate and recommend land use scheme consistent with the following objectives:

- (a) to provide a rational, orderly and efficient system of acquisition, utilization and disposition of land and its resources in order to derive maximum benefits; and
- (b) to encourage the prudent use and conservation of land resources in order to prevent an imbalance between the needs of the nation and such resources.

The Authority is also required to prepare and recommend the basic policy on the management and conservation of the country's natural resources in order to obtain the optimum benefits and to preserve the resources for future generations, and to also recommend the general measure through which such policy may be carried out effectively. There is a similar requirement to prepare and recommend a system of rational exploitation of fisheries and of the aquatic resources within the territorial waters of the RMI, including its exclusive economic zone, and also encourage citizen participation maintain and enhance the optimum and continuous productivity of the aquatic resources. Measures for the rational exploitation of fisheries and other aquatic resources may include the regulation of the harvesting and marketing of threatened species of fish or other aquatic life.

The Authority is also charged with recommending soil conservation programs, including encouragement of scientific farming techniques, physical and biological means of soil conservation, and short-term and long-term research and technology for effective soil conservation.

Where proposals for legislation and other major governmental action significantly affect the environment, the relevant Government agency must prepare a statement on the environmental impacts. The agency must also initiate and utilize ecological information in the planning and development of resource-oriented projects and make available to institutions and individuals advice and information useful in restoring, maintaining and enhancing the quality of the environment, and assist the Environmental Protection Authority. The environmental impact statement, which can be commented on by the public and other parts of Government, accompanies the proposal through the subsequent review and decision-making processes by the responsible official body.

The Environmental Protection Act makes provision for an Environmental Advisory Council of eleven members made up of eight senior Government officials and one representative of the private sector and one representative of the general public. The function of the Council is to generally advise the Authority on matters pertaining to its responsibilities, powers, duties and functions and on any matters referred to it by the Authority.

Any violation of the Environmental Protection Act is subject to enforcement action by the Authority, including the making of a cease and desist order in relation to the violation, imposition of a civil penalty, institution of civil proceedings to restrain the violation, or any other authorized action.

Under the powers given it by the Environmental Protection Act, and with the approval of the Minister of Health and Environment, the Authority has made regulations with respect to the following:

- Environmental Impact Regulations - standard procedures for the preparation and evaluation of an EIA for proposed public and private development activities that may affect the quality of the environment of the RMI; the regulations establish uniform standards under two Acts (National Environmental Protection Act 1984 and Coast Conservation Act 1988) so that environmental scrutiny of proposed development activities may be streamlined and simplified; the EIA is intended to help the general public and government officials make decisions with the understanding of the environmental consequences of their decisions, and take actions consistent with the goal of protecting, restoring, and enhancing the environment; the regulations are designed to integrate the EIA process into early planning of projects to ensure timely consideration of environmental factors and to avoid delays, as well as to identify at an early stage the significant environmental issues facing the RMI;
- Earth Moving Regulations – All earthmoving activities within the RMI must be conducted in such a way as to prevent accelerated erosion, accelerated sedimentation, and disturbance of potential cultural resources; to accomplish this, all persons engaging in earthmoving activities shall design, implement and maintain erosion control, sedimentation control, and cultural preservation measures which effectively prevent accelerated erosion, accelerated sedimentation, and adverse impact on cultural resources; in addition to the requirements of these regulations, earthmoving activities may also be subject to permit requirements emanating from other regulatory instruments pursuant to the National Environmental Protection Act 1984, the Coast Conservation Act 1988, the Historic Preservation Act 1991, the Tourism Act 1991, and other national and local enactments;
- Marine Water Quality Regulations - to identify the uses for which the marine waters of the RMI need to be maintained and protected, to specify the water quality standards

required to maintain the designated uses, and to prescribe regulations necessary for implementing, achieving and maintaining the specified marine water quality;

- Pesticide Regulations - to establish a system of control over the importation, distribution, sale, and use of pesticides within the RMI;
- Public Water Supply Regulations - to establish certain minimum standards and requirements determined to be necessary for public health and safety and to ensure that public water supply systems and water supply sources are protected against contamination and pollution and do not constitute a health hazard;
- Solid Waste Regulations - establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste storage, collection and disposal systems, with a view to preventing pollution of the drinking and recreational waters of the RMI, preventing air and land pollution, preventing the spread of disease and the creation of nuisances, protecting the public health and safety, conserving natural resources, and preserving and enhancing the beauty and quality of the environment;
- Toilet Facilities and Sewage Disposal Regulations - establish minimum standards for toilet facilities and sewage disposal to minimize environmental pollution, health hazards, and public nuisance from such facilities.

The “**Office of Environmental Planning and Policy Coordination (OEPPC) Act 2003**” established, within the Executive Branch of Government, the Office of Environmental Planning and Policy Coordination (OEPPC), which acts as: (i) an advisory body to the Office of the President, Cabinet, the Ministries, and Government Agencies, on matters of environmental planning and policy; (ii) the focal point of contact in the coordination, management and implementation of all international environmental projects/programs and to ensure the successful implementation of such projects; and (iii) the national focal point of contact in all negotiations with external sources and lending institutions on programs and/or projects of assistance.

The “**Coast Conservation Act 1988**” provides for protection and preservation of the coast from sea erosion, or encroachment of the sea, in relation to development activities related to buildings; depositing of wastes or other materials from outfalls, vessels etc.; removal of sand, coral, shells, vegetation, sea grass etc.; dredging, filling, land reclamation, mining or drilling for mineral within 25 feet landward of the mean high water line and 200 feet seaward of the mean low water line. The Act also provides for coastal zone management plans including consideration of living resources, environmental impact assessment procedures and permits for a proposed development activity.

The “**Planning and Zoning Act 1987**” assigns authority to Local Government councils to plan the use of land and water areas, promote the health, safety and general welfare of people, create residential, commercial, industrial and resort zones in municipal areas in order to lessen congestion and secure safety from fire and other hazards, demarcating land solely for use as cemeteries and prohibiting the use of any other lands for cemeteries, regulation and control of the construction, size and location of buildings and adjacent areas, prevention of overcrowding of land, and formulate rules and regulations establishing minimum standards for construction of buildings or classes of buildings (i.e. a “building code”).

The “**Marine Resources Act 1997**” establishes that exclusive management and control over living and non-living resources within RMI waters is vested in the Government. However, under the Act there is provision for MIMRA to delegate the responsibility to each Local Government so that they can manage and protect their own marine resources within their 5 miles zones. In fulfilling this act, the Authority is currently implementing a coastal resource management program in two atoll communities, Mejetto and Likiep communities. The coastal resource management program is intended to assist the atoll communities to carefully examine their present and past practices and develop strategies and plans that will

deliver best practices for conservation and management of coastal marine resources. This project also seeks to establish a community fishing practices, which results in the maximum productivity and sustainability of marine environment. Examples of the Fisheries Management Plans for these Atolls include the establishment of community owned Marine Protected Areas, and seasonal and size limits for catches.

The Act also establishes the Marshall Islands Marine Resources Authority (MIMRA) and Board, with the exclusive powers and functions to:

- (a) conserve, manage and sustainably develop all resources in RMI waters and seabed and subsoil thereunder, in accordance with the principles and provisions in this Act and in sub-regional, regional and international instruments to which the Republic of the Marshall Islands is party;
- (b) establish management plans and programs to manage the resources in RMI Waters;
- (c) issue licenses in accordance with the Act;
- (d) issue licenses for the exploration and exploitation of the seabed and subsoil of RMI waters;
- (e) negotiate and conclude access agreements and fisheries management agreements on behalf of the Government in accordance with Part VI of the Act;
- (f) implement by regulation or otherwise as appropriate access agreements or fisheries management agreements to which the Republic of the Marshall Islands is party;
- (g) coordinate and manage fisheries monitoring, control and surveillance and, in consultation with the Attorney General, enforcement of the Act;
- (h) appoint authorized officers and observers in accordance with the Act;
- (i) cooperate in the conservation and management of highly migratory fish stocks as appropriate with other coastal States in the region and States fishing in the region and high seas area and participate in appropriate sub-regional, regional and international organizations or arrangements relating to fisheries;
- (j) participate in the planning and execution of projects, programs or other activities related to fisheries or fishing, or the exploration or exploitation of the nonliving resources of RMI waters, seabed or subsoil there under, in which the Government or any agency or instrumentality that has a proprietary interest, direct or indirect, by way of stock ownership, partnership, joint venture or otherwise;
- (k) regulate the processing, marketing and export of fish and fish products;
- (l) seek technical assistance for the determination of the RMI waters zones and boundaries;
- (m) submit the budget and a report regarding the expenditure of its funds to the Nitijela on an annual basis;
- (n) perform such other duties and functions as may be necessary to carry out the purposes and provisions of the Act.

The Authority may make regulations pertaining to:

- (a) the conservation, management and sustainable development of fish in the RMI waters, including but without restricting the generality of the foregoing the catching, loading, landing, handling, transporting, possession, inspection, disposal and export of fish;
- (b) related activities in RMI waters;
- (c) the operation of fishing vessels or any other vessel which may enter RMI waters for any purpose which falls within the Act;
- (d) the use and protection of fishing gear and equipment, including fish aggregating devices and artificial reefs;
- (e) licensing for fishing and other activities falling within the Act;
- (f) pollution or the environmental quality of RMI waters;
- (g) fisheries monitoring, control and surveillance;
- (h) prescribing the powers and duties of persons engaged in the administration or enforcement of the Act and providing for the carrying out of those powers and

duties;

- (i) compliance by citizens and fishing vessels of the Republic of the Marshall Islands which engage in fishing outside RMI waters with applicable laws of other States or regional fisheries management organizations or arrangements, and applicable access agreements or fisheries management agreements;
- (j) prescribing any other matter to carry out the purposes and provisions of the Act.

The Authority must ensure the long-term conservation and sustainable use of the fishery resources by adopting best practice management measures which promote the objective of optimum utilization. The following objectives and purposes management decisions, must be taken into account by the Authority:

- (a) establish priorities for the utilisation of the fisheries resources which will provide the greatest overall benefits to the country;
- (b) ensure the proper conservation of the fishery resource through the prevention of overfishing and the taking of a precautionary approach toward harvesting when information and data about the fishery resource are lacking;
- (c) base management practices on sound management principles and the best scientific information available, to be gained through national and international research programs;
- (d) minimise, to the extent practicable, fishing gear conflicts among users; and
- (e) develop the fisheries sector in accordance with the best interests of the country.

The Authority also has powers to determine total level of fishing, allocations of fishing rights, and participatory rights in fishery, and to establish designated fisheries including fishery management and development plans, take measures for the conservation and management of fish in RMI waters, declare any fish as protected, protect and promote artisanal fisheries, and declare by regulation Fisheries Exclusion Zones for the purposes of designating an area for the exclusive or predominant use for subsistence artisanal and/or sport fishing. In respect of highly migratory fish stocks the Authority has the power to cooperate with States fishing on the high seas in respect of such stocks for the purpose of achieving compatible conservation and management measures in accordance with the United Nations Agreement. Fishing with poisons or explosives is banned. No hawksbill turtles or sea turtles, nor their eggs, can be taken or intentionally killed while on shore, and no hawksbill or green turtle can be taken or killed except for subsistence fishing and where its shell meets specific size requirements. No person shall buy, sell, display for sale, offer for sale or otherwise market any turtle or turtle product. No sponges artificially planted or cultivated shall be taken or molested, except by permission of the Authority. Harvesting of black pearl and trochus is controlled. Introduction of live fish into RMI waters is also controlled.

The Authority may take measures for the management and development of local fisheries including in internal waters and within five miles of the baseline of any atoll or island. A Local Government Council may take measures for the management and development of local fisheries in its internal waters and within the same waters. Each Local Government Council shall, as much as possible, cooperate in the development of local fisheries for the proper management and development of the fisheries resources for the benefit of the people of the Republic of the Marshall Islands. A Local Government Council may adopt an Ordinance for management, development or sustainable use of a fishery in its waters.

**“Republic of the Marshall Island Constitution 1979”** - preserves traditional land tenure and titles system; no person with customary land rights may alienate or dispose of land without approval of traditional land owners.

**“Bill of Rights”** – no taking of land except by Government and then only for public use.

**“Real and Personal Property Act”** - only RMI citizens, citizens' wholly-owned corporations and RMI government can hold title to land; non-citizens can lease land

**“Public Lands and Resources Act 1988”** – takes the basic definition of public lands as those owned or maintained by the Japanese Government during the Japanese administration; defines all lands below mean high water mark belong to the government, but no right to abuse, destroy or damage mangroves or land; exceptions include fish weirs and traps and the right to erect these as recognized by customary law, fishing rights on, and in water over reefs where the general depth of water is less than 4 feet at low tide, as recognized by customary law, the traditional and customary right of the individual landowner, clan or municipality to control the use of, or material in, marine areas below the high water mark or to fill in, erect, construct and, with permission, maintain piers, buildings or other construction on or over the adjacent water or reef (subject to the inherent rights of ownership of the government, any legal interest in or title to such marine areas; recently the Government has confirmed its commitment to exercising its rights of ownership of land below the high water mark, considering this is preferable to exercising rights of compulsory acquisition of existing land above the high water mark.

**“Land Acquisition Act 1986”** - provision for government acquisition of lands for public use and the payment of just compensation.

**“Endangered Species Act”** - protection of endangered and threatened species and subspecies: Blue Whale, Sperm Whale, Ratak Micronesian Pigeon, Hawkesbill Turtle and Leatherback Turtle; authority to set up conservation and research programs for conserving endangered and threatened species; authority to acquire land or aquatic habitats for the conservation of resident endangered or threatened species.

**“Historic Preservation Act, 1991”** – this enabling legislation endeavors to balance the preservation of cultural and historic properties and the needs of development and continuing use of land and other resources; the principle guiding the Act is to foster conditions under which modern society and prehistoric and historic resources can exist in productive harmony and fulfill the social, economic and other requirements of present and future generations.

**“Economic Policy, Planning and Statistics Office Act 2002”** – macroeconomics policy, economic planning and statistics.

**“Tourism Act 1991”** - establishes MIVA, with power to identify and recommend likely conservation areas with tourism potential; MIVA is empowered to work with any body responsible for land protected areas

**“Tobolar Copra Processing Authority Act 1992”** - to plan, establish, manage, operate, and maintain all aspects of copra processing for RMI.

**“Animal and Plant Inspection Act”** - all animals and plants entering or transported within RMI are subject to inspection; plant and animal quarantine regulations; cargo manifests required; emergency quarantine measures.

**“Export Meat Inspection Act”** - regulation of export meat and meat products; methods of slaughtering; postmortem examination; labeling, sanitation inspection; control and storage.

**“Littering Act 1982”** - prohibits the unauthorized dumping, throwing away, playing or leaving of refuse of any kind, or anything which tends to pollute, mar or deface.

**“Public Health, Safety and Welfare Act”** - inspection and control of latrines and toilets, limiting accumulations of rubbish; sanitation standards may be established for the halt of introduction of disease by insects entering on aircraft; limits accumulation of rubbish.

**“Fire Control Act 1988”** - no fires for clearing land without authorization permit and proper control

#### **b. Local**

Local Government Councils may, if there is no conflict with national legislation and with the approval of the National Government, establish local regulations (ordinances). Examples specific to certain Outer Islands are no gill nets, no commercial fishing within 12 nautical mile limit, hook and release of sport fishes, all turtles protected, pig control, garbage collection fee, no fish traps except those of traditional design and materials, prohibition on ship pollution and dumping, dog license, entrance permit for ship, yacht and other vessels, protection against cutting of vegetation by non-land owners, no commercial exploitation of coastal resources, and right to designate areas and species off limits.

#### **c. International**

**Compact of Free Association between the United States of America and the Republic of the Marshall Islands 1986; amended 2004** - pledge between the two countries to promote efforts to prevent or eliminate damage to the environment and biosphere and to enrich understanding of the natural resources of the Marshall Islands; the United States to continue to apply environmental controls which were in effect previous to the Compact; the United States to continue to apply *U. S. National Environmental Protection Act* in the RMI; - the United States to apply environmental standards similar to those of the U.S. environmental studies when conducting activities requiring a U.S. Environmental Impact Statement; the United States to provide technical support from appropriate U.S. environmental agencies in the development of environmental studies, with the RMI being able to comment during the development; the Marshall Islands has an obligation to develop and enforce comparable environmental standards and procedures.

The RMI is a party to the following international agreements:

1. Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (London, 1990)
2. Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (Copenhagen, 1992)
3. Agreement establishing the South Pacific Regional Environment Programme (Apia, 1993)
4. Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (New York, 1995)
5. Comprehensive Nuclear Test - Ban Treaty (New York, 1996)
6. Convention for the Protection of the Natural Resources and Environment of the South Pacific Region ( SPREP Convention) (Nouméa, 1986)
7. Convention for the Protection of the Ozone Layer (Vienna, 1985)
8. Convention on Biological Diversity (Rio de Janeiro, 1992)
9. Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific (Wellington, 1989)
10. International Convention for Safe Containers (CSS) (Geneva, 1972)
11. International Convention for the Prevention of Pollution from Ships ( MARPOL ) - Annex IV (Optional): Sewage (London, 1978)



12. International Convention for the Prevention of Pollution from Ships ( MARPOL ) - Annex V (Optional) = Garbage (London, 1973)
13. International Convention for the Prevention of Pollution from Ships Hazardous substances carried in packaged form (London, 1978)
14. International Convention for the Prevention of Pollution from Ships as modified by the Protocol of 1978 (London, 1978)
15. International Convention on Oil Pollution Preparedness Response and Co-operation (London, 1990)
16. International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (Brussels, 1969)
17. International Convention to Combat Desertification in those Countries Experiencing Serious Drought and or Desertification (Paris, 1994)
18. Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto, 1997)
19. Protocol concerning Co-operation in Combating Pollution Emergencies in the South Pacific Region (Nouméa, 1986)
20. Protocol for the Prevention of Pollution of the South Pacific Region by Dumping (Nouméa, 1986)
21. Protocol on Substances that Deplete the Ozone Layer (Montreal, 1987)
22. Protocol relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil (London, 1973)
23. Protocol to amend the International Convention on Civil Liability for Oil Pollution Damage (London, 1992)
24. Protocol to amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (London, 1992)
25. Protocol to the International Convention on Civil Liability for Oil Pollution Damage (London, 1976)
26. Protocol to the International Convention on the Establishment of an International Fund of Compensation for Oil Pollution Damage (London, 1976)
27. South Pacific Fisheries Treaty (Port Moresby, 1987)
28. South Pacific Forum Fisheries Agency Convention (Honiara, 1979)
29. United Nations Convention on the Law of the Sea (Montego Bay, 1982)
30. United Nations Framework Convention on Climate Change (New York, 1992)
31. Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

### **Additional Information on Environmental Policy Development**

Six goals and supporting strategies were identified in Meto200, and examples of the necessary activity content of each strategy provided. All were aimed at strengthening efforts to integrate environmental, economic and social considerations to policies by addressing crosscutting issues such as:

1. human development
2. pride in our culture and values
3. better education system for children as well as adults
4. children first as part of the Convention for Children
5. better living conditions for the people
6. improved transportation in order to serve the Outer Island communities
7. invoke traditional conservation methods
8. participate fully in the negotiations of the Framework Convention on Climate Change, Convention on Biodiversity, Trade issues, and overall sustainable development issues.

Goal 6 was Environmental sustainability: restore environmental equilibrium in the context of a modernising, urban-based economy. It was supported by the following strategies:

Strategy 1: revive the Environmental Protection Agency and overhaul its terms of reference, staffing and level of funding for effective operations;

Strategy 2: re-publicise and implement the National Environmental Management Strategy

Strategy 3: integrate environmentally prudent design and location standards into government policy-making procedures, public investment decisions and permitting of private sector investment

Strategy 4: strengthen the motivation and increase the resources of local governments (by national and local taxation and grants) to identify, clean up and maintain beaches, dumps and other trouble-spots, with the technical assistance of the revived EPA.

NESS2 provided important input to preparation of Vision 2018, RMI's strategic development plan framework for 2003 to 2018. It contains the following National Vision:

*to become a country within an inter-dependent world, with an enhanced socio-economic self-reliance, and educated, healthy, productive, law-abiding and God-loving people in which individual freedom and fundamental human rights are protected and culture and traditions are respected and development and environmental sustainability are in harmony.*

One of the "essential conditions" agreed upon at NESS2 was the need to rebuild on the lessons from Marshallese culture and traditions where environmental sustainability has always been a major consideration in the lives of the atoll communities. Ten key enabling conditions necessary to achieve Vision 2018 were also identified, with one being "more harmonized development in the context of healthy lifestyles, and our prevailing culture and sustainable environment".

The tenth goal in Vision 2018 is:

"Environmental Sustainability: (i) Developing a regulatory system that can be enforced with a high degree of compliance at all levels, in order to achieve the sustainable development of our natural resources, while protecting our environment from any adverse impacts; and (ii) Strengthening the relevant institutions and improve procedural mechanisms, so as to be able to secure the optimum support from both international and regional efforts, in minimizing the adverse impact of Climate Change."

Thus goal is supported by five objectives (with associated strategies and indicators), namely:

1. To achieve maximum benefit from all global environmental conventions through active commitment and participation;
2. To develop and have in place a contingency/adaptation plan to counter emerging threats resulting from the adverse effects of climate change, including a National Disaster Plan;
3. Enhance the level of awareness and commitment among all people in the community to contribute towards the minimization of environmental degradation;
4. To achieve the highest degree of compliance with environmental laws and regulations; and
5. Reinvigorating our cultural and traditional environmental conservation practices to harmonize development with environmental sustainability.

## Goals and Objectives for EPA Program Areas

Program Area	Goals	Objectives
Environmental Health and Water Quality	<ul style="list-style-type: none"> <li>▪ improve health of the community through increased access to safe drinking water and safe food</li> <li>▪ a clean marine environment for humans and marine life</li> </ul>	<ul style="list-style-type: none"> <li>▪ improve the quality of public water supply on Majuro and Ebeye</li> <li>▪ community and household based water supplies are safe to drink</li> <li>▪ ensure the quality of marine waters are appropriate for their planned and actual use, including recreational, conservation, fishing and industrial</li> <li>▪ minimize sources of fecal pollutants and vector borne diseases</li> <li>▪ increase access of households to sanitary working toilets</li> <li>▪ ensure pig pens have the least environmental and health impact</li> <li>▪ improve food safety of solid food sold by grocery stores, restaurants and cooked food vendors</li> </ul>
Coastal and Land Conservation and Management	<ul style="list-style-type: none"> <li>▪ conserve the environmental value of the coastal zones of the Marshall Islands by minimizing environmental degradation</li> <li>▪ regulate and control development activities in order to balance social and economic development with environmental conservation</li> <li>▪ facilitate better decision-making and policy development</li> </ul>	<ul style="list-style-type: none"> <li>▪ EIA to be a valued decision-making tool and an integral part of any major development in the RMI</li> <li>▪ develop a plan for managing the uses and development of the coastal zone in line with balancing environmental, social and economic needs</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>▪ conserve and ensure sustainable use and equitable benefits from the biodiversity of the Marshall Islands</li> <li>▪ conserve biodiversity – endemic or indigenous</li> <li>▪ prevent loss of species through over exploitation or impact of developments or accidents</li> </ul>	<ul style="list-style-type: none"> <li>▪ become a specialized unit within EPA with a primary focus on species information management systems, rehabilitation of extirpated species, protection and conservation programs for threatened species and supporting ecosystems</li> <li>▪ facilitate the effective exchange of technical and scientific biodiversity information in-country, regionally and internationally</li> <li>▪ contribute to informed decision-making regarding conservation and sustainable use of biological resources in the Marshall Islands</li> <li>▪ establish areas where conservation of species on land and in the marine environment is managed appropriately</li> <li>▪ continue to manage Jaluit Atoll Conservation Area as a regional example of a successful marine and terrestrial resource management program</li> </ul>
Waste and Pollutants	<ul style="list-style-type: none"> <li>▪ reduction in environmental impact from waste and pollutants</li> <li>▪ community is aware of, and takes responsibility for waste and pollutants</li> </ul>	<ul style="list-style-type: none"> <li>▪ incidences of violations are reduced</li> <li>▪ reduce the incidence of environmental contamination from hazardous wastes</li> <li>▪ achieve national compliance with RMI's obligations under the Montreal Protocol, including               <ul style="list-style-type: none"> <li>○ freezing consumption of CFCs at 1.16 ODP tones per annum</li> <li>○ developing regulations and enforcement process controlling the importation of ODS</li> </ul> </li> <li>▪ describe root causes for waste management problems and pilot activities to address these</li> </ul>

		at community scale and at higher-level island-wide or national scales
Education and Awareness	<ul style="list-style-type: none"> <li>▪ community that takes responsibility and works together in actively caring for the environment and public health issues</li> <li>▪ EPA has credibility and respect in the community</li> </ul>	<ul style="list-style-type: none"> <li>▪ increase knowledge of environmental issues in the community</li> <li>▪ increase knowledge of environmental issues in school children</li> </ul>
Information Management	<ul style="list-style-type: none"> <li>▪ enable the EPA to develop policy and make informed decisions due to improved information management</li> </ul>	<ul style="list-style-type: none"> <li>▪ information managed and easy to access</li> <li>▪ enhance the EPA's capacity to access relevant information from a range of sources</li> <li>▪ effectively manage information with a geographical component, in order to support better decision-making</li> </ul>
Planning and Human Resource Management	<ul style="list-style-type: none"> <li>▪ EPA staff is focus on achieving the goals of the organization</li> <li>▪ EPA is an effective and proactive organization</li> <li>▪ EPA is an employer of choice due to high staff motivation and job satisfaction of staff</li> <li>▪ EPA regularly achieves its objectives</li> </ul>	<ul style="list-style-type: none"> <li>▪ develop and maintain a working strategic plan for the EPA, that is accepted by staff and the Board</li> <li>▪ develop and maintain program plans and budgets that clearly respond to the strategic plan</li> <li>▪ develop and maintain a strategic human resource plan that supports achievement of the long-term goals of the EPA</li> <li>▪ a documented staff performance management system that is used by all the staff</li> <li>▪ personal performance plans are clearly linked to the EPA strategic plan</li> <li>▪ staff and managers have skill and comfort in using the staff performance management system, developing plans and giving and receiving constructive feedback</li> <li>▪ monitor and report on the impact of EPA's activities</li> <li>▪ strengthen the effectiveness of the legislation and governance guiding EPA</li> <li>▪ have clear processes and responsibilities between the Authority (the Board) and the staff and management</li> <li>▪ have consistency between the legislation and the actual functioning of the Authority</li> </ul>

### **Strategic Themes and Goals of the RMI National Biodiversity 2000 Strategic Plan**

#### **A – Conservation of Biodiversity and Biological Resources**

A1 – Activate traditional “mo” conservation sites

A2 – Imposition of fines and penalties on those who destroy our resources

A3 – People taking the initiatives in planting trees and crops

#### **B – Protection of the Marine Environment**

B1 – Training and capacity building toward conserving our resources

B2 – Sustainable fishing practices

#### **C – Traditional Culture and Practices**

C1 – Apply traditional skills and knowledge

C2 – Institute learning of the culture through the traditional way of passing knowledge from elders to the young, through schools, community meetings and workshops

C3 – A move toward more uses of local products

#### **D – People and Biodiversity**

D1 – Self-reliance through traditional values and cultures

- D2 – Population awareness
- D3 – Working cooperatively and justly with one another
- D4 – Clean up the environment

**E – Biotechnology and Biodiversity**

- E1 – Conservation of genetic diversity
- E2 – Protection of intellectual property rights (IPR)

**F – Biosafety and Biodiversity**

- F1 – To have in place legislation and regulatory frameworks for biosafety
- F2 – Establish systems to implement new or revised legislation and regulation of biosafety

**Environmental Performance**

**Water.** The RMI is heavily reliant on rainfall for its water supply. Natural ground water is limited to the wider land formations, such as Laura on Majuro. Only Ebeye, on Kwajalein Atoll, and parts of Majuro Atoll are served by a public water supply service. The remaining islands rely mainly on roof catchments and wells for their water. A source of freshwater for Ebeye is an artificially constructed area dedicated to collecting water. Given the low rainfall in Ebeye freshwater is supplemented by desalination of saltwater using two reverse osmosis units, each with capacities of 100,000 gallons per day. Majuro on the other hand relies on rainwater runoff from the 7,900 feet runway at the Amata Kabua International Airport as well as ground water supplied from the Laura Lens. The current water capacity of the reservoir is 36 million gallons.

According to the 1999 Census, out of a total of 6,478 households in the RMI, 404 households had public piped water inside the dwelling, 520 had public piped water outside the dwelling, the largest number, 4,560, depended upon rain catchments, 223 were using water from wells, 353 were drinking bottled water and the remaining households used other means. The Majuro Water and Sewer Company on Majuro Atoll has approximately 3,000 customers who have piped water to their houses.

There is a shortage of water in the Marshall Islands, despite relatively high rainfall in most of the country. The current water availability to Majuro residents is approximately 26 gallons per person per day. In Ebeye it is approximately 24 gallons per person per day. Unrestricted water demand for the Marshall Islands has been estimated at 45 gallons per person per day. As a result, water is normally rationed in Ebeye and Majuro, with water supply restricted to limited hours and days depending up on the supply. In recent months water in Majuro has been on a minimum of 8 hours for every other day. Water availability on the Outer Islands is a significant challenge, particularly when rainfall is not timely or frequent.

Periodic droughts, often associated with El Niño events, can cause serious problems with water supply in the RMI. During the 1982-1983 El Niño rainfall was just 10-30% of the long term mean average. On January 1, 1983 the Majuro reservoir held 23 million litres, but by May 1983 the total storage had declined to 3 million litres, most of which was reserved for hospital use. At the height of the drought associated with the 1997-1998 El Niño municipal water on Majuro was available for only seven hours every fourteen days.

After the El Niño event of 1997-98, the RMI received assistance from the U.S. Federal Emergency Management Administration (FEMA) for the provision of household water catchments to the Outer Islands. This FEMA program distributed 1,068 fifteen hundred gallon household water catchments to the Outer Islands during 2001 and 2002, however, according the 1999 Census there were a total of 2,352 homes on the Outer Islands. The RMI government appropriated \$500,000 in the FY 2002 budget for the further provision of 760

catchments of the same type. During FY 2003 the RMI government appropriated an additional \$250,000 for catchments, as well as receiving a further \$125,000 from FEMA and \$25,000 from the Canada Fund. As of the end of calendar year 2003, there were only 201 homes left on the Outer Islands who had yet to benefit under this program.

The following table provides historic information on the quality of drinking water sources in the RMI. In recent years there has been a major commitment to more comprehensive testing, including extension to the Outer Islands. Despite these efforts there is no apparent concomitant improvement in the quality of drinking water, for either the reticulated supplies in the urban centers of Majuro and Ebeye or for catchments and wells. The test results reveal an alarmingly high rate of contamination in the Outer Islands.

The table also shows that the rate of contamination in the Outer Islands is far from uniform, ranging from 40 to 90% in 2004, with most Outer Islands over 60%. As the testing program has expanded, it has revealed the true extent of the problem of degraded drinking water supplies.

**Water Quality Tested Under EPA by Area in RMI: 1995 and 1999-2003**

Area/Water Source	No. of Tests and No. Found Defective											
	1995		1999		2000		2001		2002		2003	
	No. Tested	No. con-taminated	No. Tested	No. con-taminated	No. Tested	No. con-taminated	No. Tested	No. con-taminated	No. Tested	No. con-taminated	No. Tested	No. con-taminated
<b>Majuro:-</b>												
Catchments	...	...	40	31	64	28	47	40	87	37	78	26
Coastal	...	...	171	6	27	27	0	0	0	0	85	34
City Water	...	...	2,009	151	1,091	44	2,234	100	270	35	812	154
Ice/Processed Water	...	...	11	2	7	4	15	6	24	1	212	10
Wells (Ground Water)	...	...	14	8	5	5	6	6	26	9	355	39
Restaurants	...	...	16	6	21	18	52	43	22	2	256	31
Dr. Water	...	...	2,261	204	1,215	126	2,354	195	429	84	1,798	294
<b>Outer Islands:-</b>												
Catchments	10	5	0	0	0	0	15	14	137	50	1,072	441
City Water (Ebeye)	0	0	0	0	0	0	5	1	0	0	63	18
Wells (Ground Water)	12	6	0	0	0	0	0	0	63	28	700	150
Total	22	11	0	0	0	0	20	15	200	78	1,835	609
<b>Grand Total</b>	<b>22</b>	<b>11</b>	<b>2,261</b>	<b>204</b>	<b>1,215</b>	<b>126</b>	<b>2,374</b>	<b>210</b>	<b>629</b>	<b>162</b>	<b>3,633</b>	<b>903</b>

**Testing of Quality of Catchments Water in different Outer Islands in RMI: 1995 and 2001-2003 (June)**

Outer Island	1995		2001		2002		2003	
	No. Tested	No. con-taminated	No. Tested	No. con-taminated	No. Tested	No. con-taminated	No. Tested	No. con-taminated
Arno	0	0	0	0	0	0	120	45
Jaluit	0	0	0	0	43	15	0	0
Kili	0	0	0	0	0	0	228	63
Likiep	0	0	0	0	0	0	90	35
Mili	0	0	0	0	0	0	98	77
Wotje	10	5	0	0	94	35	0	0
Lae	0	0	14	13	0	0	0	0
Namdrik	0	0	1	1	0	0	0	0
<b>Total</b>	<b>10</b>	<b>5</b>	<b>15</b>	<b>14</b>	<b>137</b>	<b>50</b>	<b>536</b>	<b>220</b>

Source: General Manager, RMI Environmental Protection Authority

It therefore comes as no surprise that the incidence of waterborne diseases is high in the RMI. The following table shows that in recent years as many as 10% of the population contract gastrointestinal diseases in a year. Again there is no clear indication of improvement in this statistic with time.

Total Number and Rates per Thousand Population of Notifiable Diseases by Type and Year in RMI: 1996 and 2001-2003

Disease	1996		2001		2002		2003	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
A. Gastrointestinal Sanitation								
Total	4,453	75.17	5,594	102.48	3,261	57.58	4,358	74.05

**Waste and Hazardous Materials.** Solid waste is arguably the greatest environmental problem facing the RMI. The change in lifestyle towards one based on consumption of imported goods with a large amount of associated packaging has meant that waste has gone from being predominantly biodegradable in the past to now being substantially non-biodegradable. In the larger developed countries sanitary landfilling is the usual method for disposing of solid waste, but in atolls such an option is very difficult to implement.

The International Waters Project pilot waste management study conducted in Jenrok, Majuro Atoll, concluded that the current waste management system is insufficient and ineffective. This is in part due to the rapid population growth and urbanization on Majuro, but a more fundamental cause is that the agencies responsible for solid waste collection and disposal lack the human, financial and technical resources necessary to maintain an effective and efficient solid waste management system. The study also concluded that while the economic and other consequences of inadequate solid waste management services are high and include adverse impacts on health services, tourism development and fisheries, they are difficult to quantify. There is also loss of economic opportunities related to recycling of waste materials and composting of organic waste. Given the high unemployment rates in the urban centers, the failure to capture such employment opportunities has a substantial impact.

The study showed the urgent need for an integrated and systematic approach to solid waste collection and disposal, with the most appropriate approach being to integrate all elements of solid waste management, including reduction, composting, recycling, disposal and, possibly, incineration. One aim would be to minimize the amount of waste materials disposed in dumps, thereby extending their useful lives. Beca International Consultants Ltd reviewed waste generation figures and concluded that total waste generation is significantly less than assumed by the USEPA in 1996 when they recommended that incineration be considered as a disposal option. Because of this, incineration is not now seen as a viable option in a twenty-year planning horizon.

Segregation and appropriate disposal of hazardous waste, was also seen as a priority. At present there are no managed, centralized systems for hazardous waste control and disposal. Generally, in the past hazardous wastes have been disposed of in an ad hoc and uncontrolled manner in the natural environment, but agencies such as the Majuro Energy Company (MEC) now manage hazardous wastes in an environmentally sound manner.

The pilot project also concluded that current institutional arrangements preclude the effective and efficient management of solid waste. Many studies have proposed that a single agency be established to manage solid waste in the urban centers and in 2004 legislation was

introduce to the Nitijela to establish a single authority responsible for managing solid waste. However, the Bill was postponed, despite widespread support from the public and the private sector. But the pilot project noted that establishment of a single authority will not solve the solid waste problem on Majuro Atoll. A solution will require careful planning that takes into account social, economic and environmental considerations. Such assessments have yet to be undertaken, though the findings of the pilot study do provide a basis for moving forward to address the solid waste issue. For example, the study can provide the basis for designing a waste reduction strategy for implementation at community level. Such a strategy would have application beyond the urban centers of Majuro and Ebeye. The pilot study also indicated that economic incentives, such as a refundable deposit on aluminum cans, may be required in order to establish a viable recycling industry.

Atoll land “owners” have traditionally viewed waste as useful material that can be used to extend the extremely limited and therefore highly valued land area, by reclaiming adjacent reef flats. While this practice may have presented few environmental problems in the past, the waste arising from modern imported materials can present serious health and environmental problems. Placement of waste has also not been engineered to allow for structural stability. This is most particularly a concern in areas subject to storm surges and other extreme climatic events. Most Ebeye and Majuro urban residents have little or no claim to land on those two atolls, having moved from the Outer Islands and having been allowed to build houses and to establish residence by Ebeye and Majuro land-owners (the *Iroj*) and land managers (the *Alap*). The land “owners” and “managers” are informally reimbursed for this permission by occasional rent payments. The majority of residents may therefore not consider waste disposal to be their concern, but rather the concern of the few land “owners” and land “managers.” The poorest of the urban poor, who have little if any claim to urban atoll land, are the most vulnerable to bad waste disposal and management.

**Infrastructure.** Building regulations have not been developed for the RMI. Neither is there any formal land use planning, despite the passing of the Planning and Zoning Act (1987). Government is reliant on voluntary access to leased land. It owns an insignificant portion of land, and has a policy not to engage in compulsory acquisition of land. For all these reasons the siting of infrastructure is somewhat ad hoc, and environmental performance is often far from ideal. For example, in Laura (Majuro atoll) graveyards, pig and chicken pens, toilets and septic tanks are located on, or inappropriately close to, land under there is a freshwater lens supplying water to 3000 homes in Majuro. The lack of a building code and control over siting of infrastructure often results in new buildings being located where there are easements for utilities and other services.

**Transport.** Inter-island transport services, by air and sea; effectiveness (food, fuel, transport of copra and fish) and efficiency of services; government and private sector involvement; emergency capability – material in Disaster Management Reports

The total number of vessel/charter trips (“field trips”) to the Outer Islands declined from 54 in 2002 to 37 in 2003. The Ratak Chain (northern sector) was particularly hard hit, with the number voyages declining from 18 to 10. The copra cargo declined from 3333 tons in 2002 to 1743 tons in 2003, while general cargo decreased from 275,000 tons to 75,000 tons. Passenger numbers decreased from 4,958 to 3,016 over the same period. In the 2003 survey of hardship in RMI a lack of such “field trips” was specifically identified as a cause of hardship in the Outer Islands.

The road network in RMI consists of about 40 miles of sealed roads and 37 miles of unsealed roads. Nearly 4,000 vehicles were registered in 2003.



**No. of Vehicles Registered by Type in Majuro: 1986,1991, 1996, and 2001-2003**

Type	1986	1991	1996	2001	2002	2003
Car	525	806	567	1,614	1,647	2,700
Jeep	20	24	28	80	89	74
Station Wagon	0	0	34	72	97	100
Mini Pick-up	0	43	12	19	37	15
Mini Van	0	0	30	60	40	54
Scooter/Motor Cycle	10	42	16	38	32	41
Pick-up	258	498	369	530	566	452
Van	65	38	126	115	117	119
Bus	4	4	7	48	58	36
Truck	50	33	48	80	135	113
Heavy Equipment	0	0	70	93	101	94
<b>Total</b>	<b>932</b>	<b>1,488</b>	<b>1,307</b>	<b>2,749</b>	<b>2,919</b>	<b>3,798</b>

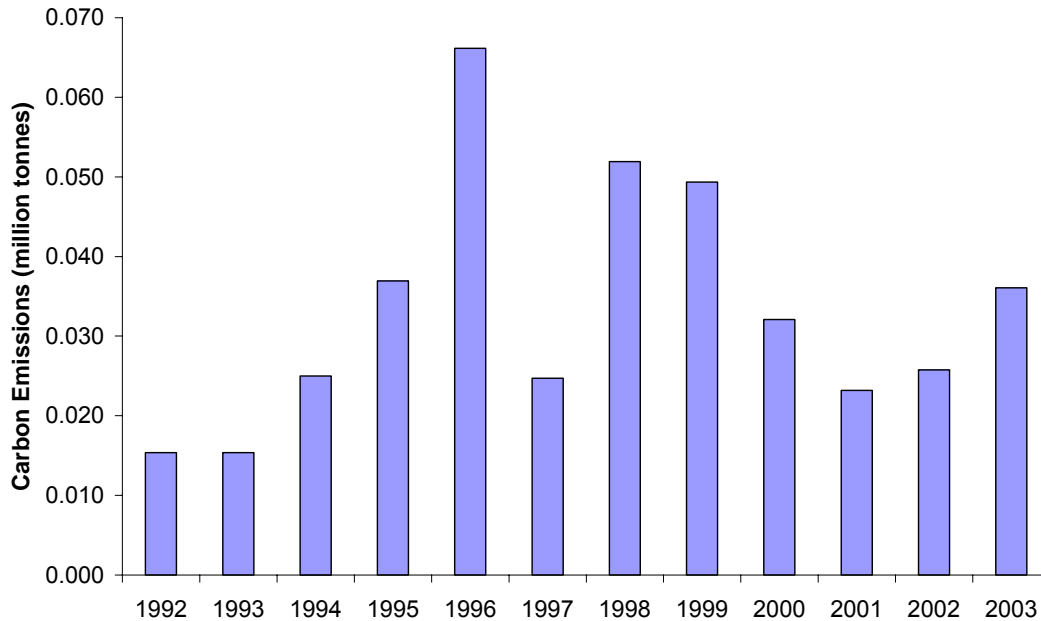
*Source: Traffic Investigation Division, Department of Public Safety, Majuro, RMI*

**Telecommunications.** Radio stations play a particularly important role in communications throughout the islands. As of 1999, 90 percent of homes in Majuro Atoll had a radio. Percentages were lower in the Outer Islands. If information needs to reach the public quickly, radio and television are the primary means used to inform the public. The main communications to the outer atolls is high-frequency radio, though a mini-satellite system provides services for Jaluit and Kili. There is a full time communications link between Majuro and the outer atolls as long as someone is manning the radio at both ends. The quasi-privatized NTA has a monopoly on the provision of telecommunication services for the RMI. Majuro, Ebeye, and Gugeegu Island have telephone services, including direct dialing access to international destinations.

Generally, telecommunications with the Outer Islands and atolls are regarded as unsatisfactory. The Government is considering a new high-frequency-based network using solar power and laptop computers to service health centers, banks, Air Marshall Islands (AMI), distance education and local governments.

**Energy.** According to the 1999 Census, the main sources of household energy in the RMI were electricity (63.3 %), kerosene (30.9 %) and solar energy (5.2 %). For cooking, the main sources were kerosene (40.5 %), wood (29.9 %), electricity (26.3 %), propane gas (1.7 %) and charcoal (1.1 %). Centrally generated electric power is available on Majuro, Ebeye, Jaluit, Wotje and Kili. The Majuro power station was enlarged in 1998 by construction of a new additional 12.8 MW plant, funded by a commercial loan of \$11m. A small power station on Rong-Rong island (Majuro Atoll), serving twenty-five customers, was recently commissioned. In some other islands, such as Mili, Enewetak, Namu, Arno, and Maloelap, some households have small power generators.

MEC imports diesel fuel for its power stations and also supplies fuel to overseas fishing vessels and to government boats. MEC also owns an LPG company, supplying bottled gas to households and businesses. The following figure shows estimated carbon emissions from the burning of net imports of fossil fuels to the RMI.



Estimated carbon emissions from burning of fossil fuels imported to the RMI.

The price for kerosene on the Outer Islands is over \$3 per gallon. It is also dangerous as most homes on the Outer Islands are constructed of wood or local materials. Use of solar systems for lighting and radio operation is cheaper for the average household and reduces some of the dangers of using petroleum products and open flame in small wooden or thatch dwellings. The monthly fee for solar systems is in the range \$8 - \$12 per month. As part of the Government's commitment to alternative energy a franchise and lease agreement was signed between MEC and the Government. The first project under this new agreement was the solar electrification of Namdrik atoll, which consists of 100 75 watt units. A monthly fee of \$12 per household is charged. This compares average consumption of kerosene per household was 14 litres at a cost of \$14/month. Monthly consumption of disposable D cell batteries was 13 units/month at a cost of \$8/month. Part of the kerosene consumption is due to the 60 kerosene stoves available on Namdrik atoll, but most of them are just used randomly. A significant part of D cell batteries is for torches for walking at night and night fishing but it is estimated that these expenses have been reduced up to 2/3, due to the equivalent service provided by the solar systems. In conclusion, the \$12 monthly fee presently collected from solar clients is not an extra expense but an alternative to the former kerosene and batteries expenses for house and yard lighting. Households did not have a good picture of such balance as buying one liter of fuel or 2 disposable batteries at a time is less impressive than paying the \$12 monthly bill.

**Water.** The security and quality of public water supply on Majuro and Ebye are problematic. The capacity of the Majuro water supply to meet dry-weather demand is inadequate. The supply of fresh water on Majuro is not continuous, being provided for only part of the day and for alternate days of the week. It is difficult to guarantee potable water supplies to households as contamination occurs when the water sits in the pipes during times when the pumps are idle. In addition, only one of the current six reservoirs is covered. Also households often fill private catchments with water during supply periods, and subsequently use the water from their catchments to provide a more continuous supply. The water supply to households may also be degraded through contamination of the private catchments. Widespread installation of household water tanks has reduced demand for the piped (and chargeable) supply during rainy periods. The public water supply is increasingly becoming

an insurance against prolonged dry spells, but this is when the capacity of the system is inadequate.

The current water supply regulations are based on there being a continuous supply of potable water. They need to be reviewed, including consideration being given to the use of more appropriate and practical measures of water quality. In addition, the public need to be made more aware of water contamination and educated about how best to manage it on a household level. Construction of an additional 30 million gallon reservoir for the Majuro water supply system will soon begin. This will improve security of supply. The Laura Lens, which is capable of delivering 350 to 400 thousand gallons of water per day from six wells, is the only source of supply during extended periods of drought which occur during a prolonged El Niño. As noted above, uncontrolled building over the Laura Lens is placing this source at risk. The problem could be resolved through education and awareness and, where necessary, through enforcement of regulations.

Particularly on the Outer Islands, where water supplies are usually household- or community-based catchments or wells, there is a need for households and communities to be able to monitor and manage their own supplies. This requires development of at least a basic understanding of water contamination and how it relates to human health, how to monitor water quality, and how to design, manage and maintain a safe drinking water supply. Surveys show that between 60 and 80% of catchments on the Outer Islands are contaminated with fecal coliforms, making the water unsafe to drink without boiling or other treatment. Awareness of this contamination, and of simple management techniques, can greatly reduce the risk of illness. EPA is now implementing education and awareness programs in both Majuro and Ebeye. EPA is also providing test kits, training (on the job and more formal – classroom and laboratory based) for staff of the Local Councils, and awareness raising in order to develop capacity in Outer Island communities to monitor and manage their own water supplies and catchments.

In FY2004 EPA was allocated money under the Amended Compact of Free Association with the United States. Performance based budgeting and monitoring was also introduced. Prior to this injection of additional funding financial resources were inadequate for EPA to carry out its mandate in an effective manner. The improvement in performance has been dramatic, providing targeted data for both surveillance and informed decision making. Examples are presented in the table below.

Results of Water Quality Testing, 2004

Location	Category	Number Tested	Number Contaminated <sup>1</sup>	% Contaminated
Majuro	Public	74	14	19
Ebeye	Public	17	2	12
Majuro <sup>2</sup>	Ice/Processed Water	212	10	5
Majuro <sup>2</sup>	Restaurant Drinking Water	256	31	12
Enewatak Atoll	Household/Community	108	77	71
Namodrik Atoll	Household/Community	79	61	77
Arno Atoll	Household/Community	72	50	69
Maloelap Atoll	Household/Community	151	113	75
Ailuk Atoll	Household/Community	78	48	62
Mejit Island	Household/Community	104	61	39
Aur Atoll	Household/Community	96	74	77
Jaluit Atoll	Household/Community	22	20	91
Ebon Atoll	Household/Community	63	75	84

<sup>1</sup> With fecal coliforms

<sup>2</sup> Data for 2003

EPA also conducts regular monitoring of marine water quality in Majuro Atoll and Ebeye. Fecal coliform counts as high as 4600 per 100 ml have been recorded (maximum safe level for swimming and taking fish for consumption is 400 fecal coliform per 100 ml), with several sites exceeding the standard on a regular basis.

Several areas which have been neglected to date and that require attention are incorporating and enforcing rainwater harvesting into building design, promotion of water efficient appliances, assessment, management and protection of the Laura groundwater lens, and promotion of large scale and household rainwater harvesting.

Island	Atoll	2000 Water Demand (gpd)	Lens Yield Avg. Rainfall (gpd)	Lens Yield Drought (gpd)	Lens Storage Capacity (Mil-gal)
Jabor	Jaluit	28630	155800	87100	29.8
Jaluit	Jaluit	7541	1677	939	0.9
Imrodj	Jaluit	4392	5390	3010	0.58
Taroa	Maloelap	4642	260000	73200	60.8
Airok	Maloelap	6150	129600	35500	49.4
Jang	Wotje	3318	51000	14000	11.9
Wotje	Wotje	15272	544300	142600	133.2
Wormej	Wotje	5756	101900	26700	25.7
Majkin	Namu	7463	73800	43300	51.6
Namu	Namu	9437	62200	38200	62.5
Mae	Namu	4710	14700	8600	4.8
Airuk	Ailinlaplap	12103	108300	67400	58.3
Buoj	Ailinlaplap	9296	39300	24400	29.1
Woja	Ailinlaplap	13194	114700	71400	209.5
Ebon	Ebon	18656	463500	249600	528.3
Toka	Ebon	8482	258700	139300	110.4
Lae	Lae	9220	112300	67100	35.8
Ujae	Ujae	14607	68800	41100	25.3
Mejit Island		14481	256000	67000	99.8
Ron Ron	Majuro	7155	74300	22700	11.2

Source: Final Report On Water Resources Evaluation and Proposed Water

Development Plan for Ten Atolls Marshall Islands, September 2000

Ministry of Resources and Development and US FEMA, Region I

X

Numerous oil and water pollution violations have been served to fishing and private vessels in Majuro, by EPA. Concerns include increased eutrophication and pollution of coastal areas from sewage and industrial wastes, degrading of marine habitat and marine life. The spread of cholera, dysentery and/or other waterborne diseases caused by the discharge of sewage in soils that are not suitable for drainfields is a problem west of the airport. People swimming near beaches could be exposed to the raw sewage being discharged and potentially become ill.

**Sanitation.** The following table shows level of access to sanitation on selected Outer Islands.

Location	Number of Homes	Per Cent without Toilets
Enewetak Atoll	84	40
Namdrik Atoll	79	30
Arno Atoll	78	68
Maloelap Atoll	99	59
Ailuk Atoll	64	30

**Waste and Hazardous Materials.** Control of persistent organic pollutants, under the Stockholm Convention, pesticides and other hazardous materials is integrated in one program due to the similarities in the required management approaches.

In order to meet its obligations under the Montreal Protocol, the RMI has prepared a National Compliance Action Plan for Ozone Depleting Substances. Currently the RMI is in full compliance with its obligations regarding the consumption and importation of CFCs.

The coastal and marine environment at Majuro atoll is highly vulnerable to the accidental release of petroleum products into the lagoon. Vessel traffic within Majuro atoll is considered heavy for this region of the Western Pacific. Majuro is the homeport for a large foreign longline fishing fleet. Likewise, many support vessels such as container ships, pelagic purse seine vessels, motherships (*i.e.*, freezer ships), fuel ships, and yachts enter and moor in Majuro lagoon. A release of petroleum product in Majuro lagoon may pose a considerable threat to the environment and economy. A catastrophic release of product due to a vessel grounding in the Kalalen channel could result in product dispersion throughout the lagoon. Vessel and spill response activities could be confounded at this location since the Kalalen channel is exposed to large oceanic swells. Coastal and shallow marine habitats would be highly vulnerable to a moderate or large release of product. Seabirds, shorebirds, sea turtles, and cetaceans would be vulnerable and require immediate care and rehabilitation in order to survive contact with petroleum products. Also, a large vessel grounded in the Kalalen channel may obstruct vessel traffic and potentially impede other vessels from entering or exiting the channel, disrupting the flow of commerce throughout the country.

Other sources of impacts to wildlife and habitat may occur from chronic exposure to petroleum products. Sources of chronic exposure include disposal of bilge water in the lagoon by vessels and yachts, and non-point source run-off from land based facilities (e.g., airport, road, fuel storage facilities).

Fishing line and nets often entangle coral colonies. Discarded trash accumulates in the lagoon near the docks as well as in other areas. Discarded marine debris accumulates and can cause direct physical impacts to coral colonies by scouring the benthos during large swell or wave action. Marine debris may also entangle sea turtles that are currently endangered or threatened. Sea turtle populations are significantly reduced from their historical densities due to a variety of anthropogenic impacts, such as entanglement. Reducing the marine debris threat to sea turtles would be a positive contribution to rebuilding sea turtle populations.

A disaster preparedness mitigation assessment was undertaken by US experts in 2003 (United States Army Civil Affairs, 2003). Marine biologists conducted an assessment of the habitat in the vicinity of the sewer outfall. The coral reef habitat in the vicinity of the diffusers and pipe was severely degraded due to direct physical impacts and chemical influences from the outfall. Within a few meters downcurrent of the diffuser coral coverage increased though

it appeared to be degraded (discolored). Strong currents flush particulate matter from the area. Pipe footings located in the shallows (depth about 2 meters) were displaced, possibly from strong waves or storm events.

The team also inspected 12 storm water drains located at the Rita and Uliga communities, Majuro Atoll. Most of the drains were not functional, the pipes being clogged with sediment or trash; one pipe was buried; several pipes were punctured and drained into the ground prior to discharge at the outlet. Environmental consequences were noted to include point source pollution discharge into the subsurface environment and the ground water table, with risk to groundwater under the populated areas of Rita and Uliga villages. This poses a health risk to villagers if drinking water is contaminated. Fish and wildlife resources may be exposed to contaminants that leach into the shallow lagoon environment. The Ministry of Public Works now undertakes maintenance on storm water drains.

The International Waters Project pilot waste management study conducted in Jenrok, Majuro Atoll (OEPPC, 2005) recommended that a detailed operation plan be developed for a centralized collection and sorting station for recyclable waste, building on the findings of a proposed cost-benefit analysis. This would include production of compost from organic waste. A business feasibility study should be undertaken to assess the viability of purchasing aluminum cans and plastic bottles the community and reselling them to a recycler, for profit. It was also recommended that MALGOV prohibit the disposal of commercial waste in community bins. Businesses should dispose of their waste in a designated collection area, or hire bins for a fee. Given the large quantities of Styrofoam products in the waste stream, it was also recommended that importation of such material be banned given that paper-based alternatives are available.

**Infrastructure and Equipment.** RMI's post-war colonial experience and ready access to Compact funding since independence encouraged the neglect of asset maintenance in favour of asset replacement. Recently new bilateral donors have also provided funds to replace assets prematurely written off for lack of maintenance. In 1999, the RMI established the Marshall Islands Intergenerational Trust Fund (MIITF) with a view to achieving greater financial autonomy in the management of its recurrent budget, providing an adequate level of social infrastructure and services, and enhancing the capacity of the Government to effectively use external capital development assistance. To capitalize the MIITF, the RMI set aside \$14 million in 2002 and \$15 million in 2003 of its capital improvement funding provided by the Compact. By setting aside this \$29 million, and given that previous to 2002 the Compact's capital improvement funding was going towards bond payments, the RMI has starved its infrastructure development and maintenance for the past 5-6 years. The negative impact is that the RMI does not have sufficient funds to meet its most urgent infrastructure needs, including the repaving and upgrading of the Majuro International Airport. Government-owned assets (buildings, equipment, vehicles and ships) have been allowed to decay into an unserviceable condition. Commercial assets have been less directly affected by the public sector's no-maintenance culture, but the malaise has damaged public morale and the wider reputation of RMI. Vision 2018 proposes implementation of policies and programs to ensure infrastructure related assets are maintained appropriately, on a regular basis. The Compact's amended economic assistance package sets aside 10% of the infrastructure development budget for maintenance.

Vision 2018 also proposes development and implementation of a Building Code in order to encourage physical planning and zoning and ensure the construction of safe residential houses. The Building Code will include provisions aimed at ensuring greater energy conservation, provision for water catchments, and planting of trees, gardens and lawns around houses and other buildings that are constructed, renovated or remodeled.

One of the major roadblocks for community development on the Outer Islands is the lack of access to construction materials. All materials have to be shipped in from either Majuro or Ebeye. The shipping of these materials to the Outer Islands from these two urban areas is expensive and subject to irregular schedules. This places an added burden on these people and communities where cash income is already relatively scarce. The cost of a 4-inch wide cement block is \$1.10 plus shipping costs. This can make even the most modest of construction or housing projects extremely expensive for people and communities with little cash. One of the challenges is locating appropriate materials or tools that can make a difference in these cash poor communities. The average budget for Outer Island local governments is between \$15,000 - \$20,000 and average household incomes are between \$500 - \$1,500. A partial solution has been the introduction of manual cement block making machines, particularly in areas that do not have access to power. These machines drastically reduce the cost of new/improved housing, pigpens and other community or public projects. The cost of the average block from this machine is \$.30 cents, translating into a savings of over 70% per block. These machines can make the Outer Islands less dependant on resources from the urban centers, stretch the limited incomes in a very effective manner and improve the quality of life in these isolated communities. To date these machines are in operation on Ebon, Mili, Arno, Likiep, and Wotje atolls and Mejit island.

**Transport.** With its isolated position in the middle of the Pacific Ocean, sea and air transportation are key to the economy and life in the Marshall Islands. Sea and air transportation have been the main link to the rest of the world for decades, but ground transportation has recently made a significant impact on the daily lives of a majority of the population in the RMI. Private automobiles and taxis now provide greater freedom to work farther from home, obtain goods and services and to recreate. Transportation of petroleum products to the Marshall Islands and the danger of spills also present a major challenge to protect the natural resource fisheries and waters that endow the country.

Government policy of moving towards more self-reliance, development of the private sector, and encouragement of competition in Outer Island transport exists within the reality of low but essential transport demand, high costs of service provision and low prices for copra which is the principal commodity shipped from the Outer Islands. A socially acceptable minimum level of transport service to many of the Outer Islands is not commercially viable and hence is dependent on some form of financial assistance. The Government has other objectives for sustaining the Outer Islands, such as limiting population drift to Majuro and Ebeye and providing employment opportunities. Given the historic world low price for copra, the industry is currently sub-economic. It is acting as a means of redistributing income to the Outer Islands, rather than acting as an income earner for the country. Recently MOTC adopted a competitive tendering system for the supply of Outer Island shipping services to bridge the gap between the desirable minimum service level and that which could be provided commercially. But only one operator was prepared to bid for a contract using the operator's vessel. Competition by Government subsidized vessels is seen as unfair competition by the private sector. The lack of ability of the private sector to provide a service under performance, operating and financial conditions set by the Government, reinforced the Government's skepticism of the appropriateness of the private operator competitive franchise model in the RMI as well as its preference for a publicly owned and operated domestic shipping service. Both National and Local Governments looked to use other means for supplying a basic shipping service to the Outer Islands, including re-introduction to service of a Government vessel, Government acquisition of two further passenger/cargo vessels and moves by Local Governments to acquire vessels to service their own island or as part of island group arrangements. Government vessels (with three operated by merchant companies) and one private sector vessel presently supply the field trip service. The Government now has a major investment in ship tonnage, after a period with virtually none. Moreover, from a shortage of vessel tonnage there is now over supply. Operating

costs for the current vessels, which in this case are relatively insensitive to tonnage, vary between \$1,100 and \$4,900 per day when the ships are at sea and between \$500 and \$2,100 when in port.

Land, sea and air transport systems to the Outer Islands are still inadequate. Remoteness, unreliable and uncompetitive transport services contribute to poverty by reducing opportunities to market island produce and products and by increasing the price of staple commodities in the Outer Islands. The price of staple commodities in the Outer Islands has been found to be sensitive to the level of shipping service and competition between merchant suppliers. In some cases prices for rice rose to double that in Majuro during times of transport shortage. Even with the current improvement in services, mark-ups of 30% are common, whereas only 10% can be justified on transport costs at current freight rates. Such price differentials have a major impact on Outer Island households with small disposable cash incomes and limited cash generating capabilities. Government is moving to apply maximum price controls on staple commodities as part of agreements with merchants renting space of the field trip ships. The ADB TA "RMI Outer Island Transport Infrastructure" identified the essential qualities in an improved transport service for Outer Island communities as: (i) adequate frequency (6 to 8 weeks); (ii) reliability of service – services need to run close to schedule as production activity is tied to shipping schedules; (iii) limited duration of voyage for passengers – extended voyages incur costs of subsistence and take people away from their homes for long periods; (iv) capacity to load cargo; (v) availability of store goods for purchase at the terminus of the field trip; and (vi) long term sustainability.

The domestic air service operated by Air Marshall Islands faces a limited market overlap between, for example, air and sea freight, but a shortage of airfreight capacity for higher value, low weight cargo such as handicrafts and produce. Most of the Outer Island runways are not yet paved. This, along with overgrown airstrips and uneven runways, results in a high degree of wear and tear for the Air Marshall aircraft that provide the domestic air services. Increased maintenance downtime reduces passenger and freight loadings and hence fare revenue. While a paved runway system throughout the islands would be preferred, this is not economic for the majority of strips due to the low frequency of flights. However, much could be done to improve the standard of maintenance of the grass/coral strips, and at relatively small cost. The skills to do this work are available, and the MPW Development Plan 2004-2009 includes a routine maintenance schedule and budget requirements. However, no maintenance of Outer Island strips is scheduled for 2005 due to lack of funds and operational equipment.

The ADB TA "RMI Outer Island Transport Infrastructure" identified three options for improved airstrip maintenance: (i) devolve responsibility to Local Government Councils and provide maintenance equipment and a storage building to each Outer Island – high risk that the equipment would be diverted to other uses and would not be maintained adequately; (ii) contract the private sector to carry out maintenance work on a rotational basis – preferred if MPW lacks the capacity, would be more efficient in use of equipment and more likely to achieve a uniform maintenance standard; and (iii) resource the MPW to provide the maintenance – risk is that resources would be diverted, due to preoccupation with construction of new airstrips and reopening of airstrips that have been closed by the Department of Civil Aviation due to being overgrown and rough.

An ADB TA, Preparation of the Outer Islands Transport Infrastructure Project, has proposed a package of \$10 million of marine, land and air transport infrastructure development aimed at improving the reliability and reducing the cost of transport between the Outer Islands and the main population centers. This is from a total pool of projects of some \$14.5 million. The mix of projects includes docks and jetties, beach channels, warehouses and track improvements, airstrip extensions and navigation aids.



The scale of the proposed engineering and building works is small, and the projects will almost without exception be located in places where there has historically been a concentration of human activity and interaction with ecosystems. Except for one new site where there is already a beach channel and causeway, all of the proposed activities related to ship docks are extensions and repairs to existing structures. The beach channels are all widening and/or deepening of existing naturally formed or engineered channels. Open pile structures, rather than breakwaters, are proposed where there is any potential for disruption to littoral transport of material. Submerged archeological resources may be present at certain sites. Dive inspections will be required before clearance is given for undertaking marine engineering work.

Given the vulnerability of the RMI to natural and other disasters, and the dispersed nature of the population, the transportation sector is critical to providing early disaster relief and subsequent assistance with disaster recovery. However, the ability to provide such support is itself highly likely to be compromised in a disaster. All airports are vulnerable to hazard events such as storm surges and tsunamis. Marine vessels may themselves be incapacitated during a natural disaster. Roadways are also susceptible to storms and waves and at times become impassable due to erosion and fallen trees. The lack of maintenance equipment does cause delays in clearing/repairing roadways after storms and other disasters.

**Telecommunications.** In an emergency (natural or human disaster) redundant systems are available for communications within country. Inmarsat satellite phones, multiple radio stations, VHF radios (on Majuro atoll), long distance HF radios and HAM radios are just examples of some of the systems that can be relied upon in the event of an emergency. But if a radio tower was to be disabled the ability to communicate within and between islands would be reduced substantially. Moreover, loss of satellite communications would leave the country unable to communicate with the outside world except for Inmarsat phones and the emergency dish. [refer to situation when the satellite failed] Since all international phone communications are routed from Majuro to Guam via satellite, and thence by submarine cable to the destination, a very large vulnerability is the reliance on Guam's telecommunications. If the telecommunications system located in Guam was disabled, RMI would not have any international communications other than the locally operated HF and HAM radios, INMARSATS and the emergency satellite dish.

**Energy.** As in all other national development programs, the environment is being given increasing emphasis in RMI's National Energy Policy. It is recognized that the link between energy production and use on the one hand and global warming and sea-level rise on the other, places more pressure on the RMI to consider environmental issues in national energy policy and planning. By incorporating environmental considerations in to the energy policy the negative environmental impacts can be lessened, for example through fuel substitutions, greater use of renewable energy in the national energy mix and promotion of energy efficiency programs. Reduction of greenhouse gas emissions from use of petroleum fuels in transport and electricity generation is an important goal of Government. The safe disposal of waste oil and solar batteries are both key issues and significant environmental concerns for the RMI.

As noted above, the private sector is already well advanced with a demonstration project for a small scale coconut oil production plant in an Outer Island.

## Appendix 8

### Information on Environment Related Assistance

<b>Sector/Thematic/Area</b>	<b>Other Development Partner's Strategy/Activities</b>	<b>Project Status</b>
A.Law and Public Sector	MoF Tax Enhancement – (US)	Ongoing (starting 2005)
B.Private Sector Development	Utrik Atoll Local Gov't/NOAA Ship Transfer Operational Plan (US)	Ongoing (starting 2005)
C.Health, Nutrition, and Social Protection	Other Federal Support (US)	Ongoing
D.Inclusive Social Development	Maintenance & Infrastructure Dept.- BECA (US) Community Halls on Majuro and Ailuk (Taipei, Taiwan)-completed 2004	Ongoing (2004-2006) Completed (2001 & 2005)
E. Transportation & Communication	Ailuk Jetty Dock (Taipei-Taiwan) New Ship (Taipei, Taiwan) RongRong Dock (Taipei, Taiwan) Majuro Roads Paving-(Taipei, Taiwan) Airport Runway Maintenance/Upgrade (US)	Completed (2005) “ Completed (2004) Completed (2002) Ongoing
F.Energy	RongRong Power Plant-Taipei, Taiwan) Outer Is. Solar Project (Taipei, Taiwan)	Completed (2004) Ongoing
G.Water Supply Sanitation & Waste Management	Ebeye Water & Sewer Supply (US) Outer Is. Water Catchments (Taipei, Taiwan)	Ongoing Completed (2004)
H.Industry and Trade	Rural Housing Grants/Loan for Outer Islands (US)	Ongoing
I.Agriculture and Natural	Forest Resource Management (US)	Ongoing (2004-2005)

## Appendix 9

### List of ADB Assistance to the RMI

TA No.	Project Name	Type	Amount	Source of Fund	Date Approved
1775	Majuro Water Supply	PP	100,000	TASF	30 Oct 1992
1826	Institutional Strengthening of the Environmental Protection Authority	A & O	300,000	JSF	24 Dec 1992
1833	Preparation of a Health and Population Project	PP	250,000	Norway	31 Dec 1992
1946	Institutional Strengthening of the Majuro Water and Sewer Company	A & O	250,000	TASF	09 Sep 1993
1993	Strengthening Agricultural Support Services	A & O	350,000	JSF	23 Nov 1993
2041	Outer Islands Electrification Feasibility Study	PP	200,000	JSF	29 Dec 1993
2065	Non Formal Environmental Education	A & O	300,000	TASF	23 Feb 1994
2164	Health Management Information System and Health Planning	A & O	400,000	JSF	22 Sep 1994
2164	Health Management Information System and Health Planning (Supplementary)	A & O	65,000	JSF	23 July 1997
2349	National Fisheries Development Plan	A & O	600,000	TASF	22 Jun 1995
2415	Ebeye Power Development Study	PP	200,000	TASF	03 Oct 1995
2483	Tourism Development	A & O	405,000	JSF	19 Dec 1995
2483	Tourism Development (Supplementary)	A & O	150,000	TASF	07 Apr 1997
2854	Fisheries Management	A & O	598,000	JSF	02 Sep 1997
3522	Community-Based Coastal Marine Resources Development	A & O	298,000	TASF	25 Oct 2000
	Outer Islands Transport Infrastructure	PP			
	TOTAL		4,466,000		

#### Environment-related<sup>5</sup> Loans to Republic of Marshall Islands (1992<sup>6</sup> to present)

	Majuro Water System	TA	0.7	ADF	Sept 1993
	Fisheries Development		6.95	ADF	Sept 1991
	Health and Population		5.4	ADF	Sept 1994
	Majuro Water Supply and Sanitation		9.2	ADF	Sept 1995
	Ebeye Health and Infrastructure		9.25	ADF	Aug 1999
	Outer Islands Transport Infrastructure		7.0	ADF	Nov 2002
	Skills Training and Vocational Education				

<sup>5</sup> Projects with at least one environmental component in their objectives were defined as environmentally related.

<sup>6</sup> 1992 was used as the baseline year because of the Earth Summit (UNCED) held that year in Rio de Janeiro, Brazil, which gave environment an important recognition in development undertakings.

## Appendix 10

### Concepts for the Proposed Three New Technical Assistance Projects

#### Developing Policies and Procedures, and Enhancing Capacity, for Land Use Planning and Regulation of Building at Local Government Level in the Republic of the Marshall Islands

#### Concept Paper

Date: 9 May, 2005

<p><b>1. Type/modality of assistance</b> (double-click on appropriate box)</p> <p><input type="checkbox"/> Lending</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Project loan</li><li><input type="checkbox"/> Program loan</li><li><input type="checkbox"/> Sector loan</li><li><input type="checkbox"/> Sector development program loan</li><li><input type="checkbox"/> Other:</li></ul> <p><input type="checkbox"/> Nonlending</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Project preparatory</li><li><input checked="" type="checkbox"/> Other than project preparatory<ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Economic, thematic, and sector work</li><li><input checked="" type="checkbox"/> Institutional development</li><li><input checked="" type="checkbox"/> Other:</li></ul></li></ul>										
<p><b>2. Assistance Focus</b></p> <p>a. If assistance focuses on a particular sector or subsector, specify the Sector: Subsector:</p> <p>b. For project preparatory and lending, classification</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Targeted Intervention</li><li><input type="checkbox"/> General intervention</li></ul> <p>c. Key thematic area(s)</p> <table border="0"><tr><td><input checked="" type="checkbox"/> Sustainable Economic Growth</td><td><input checked="" type="checkbox"/> Governance</td></tr><tr><td><input checked="" type="checkbox"/> Inclusive Social Development</td><td><input type="checkbox"/> Regional Cooperation</td></tr><tr><td><input type="checkbox"/> Gender and Development</td><td><input type="checkbox"/> Private Sector Development</td></tr><tr><td><input checked="" type="checkbox"/> Environmental Sustainability</td><td><input checked="" type="checkbox"/> Capacity Development</td></tr><tr><td><input type="checkbox"/> Other:</td><td></td></tr></table>	<input checked="" type="checkbox"/> Sustainable Economic Growth	<input checked="" type="checkbox"/> Governance	<input checked="" type="checkbox"/> Inclusive Social Development	<input type="checkbox"/> Regional Cooperation	<input type="checkbox"/> Gender and Development	<input type="checkbox"/> Private Sector Development	<input checked="" type="checkbox"/> Environmental Sustainability	<input checked="" type="checkbox"/> Capacity Development	<input type="checkbox"/> Other:	
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<input checked="" type="checkbox"/> Inclusive Social Development	<input type="checkbox"/> Regional Cooperation									
<input type="checkbox"/> Gender and Development	<input type="checkbox"/> Private Sector Development									
<input checked="" type="checkbox"/> Environmental Sustainability	<input checked="" type="checkbox"/> Capacity Development									
<input type="checkbox"/> Other:										
<p><b>3. Coverage</b></p> <p><input checked="" type="checkbox"/> Country                      <input type="checkbox"/> Subregional                      <input type="checkbox"/> Interregional</p> <p><input type="checkbox"/> Internal policy development</p>										
<p><b>4. Responsible division/department:</b> PAHQ, PARD</p>										
<p><b>5. Responsible ADB officer(s):</b> Edy Brotoisworo</p>										
<p><b>6. Description of assistance(s)</b></p> <p>a. <b>Background/linkage to country/regional strategy:</b></p> <p>A high priority for economic and development planning in RMI is to ensure that there is minimal impact on the natural</p>										

ecosystems and oceanic processes that sustain the fragile atoll- and island-associated marine systems. This means not only sustainable harvesting of living resources and extraction of non-living resources, but also ensuring that land use and development practices are such that the integrity of the natural environment is maintained. However, in recent decades neither of these requirements has been met. Environmental quality has declined, there has been unsustainable and environmentally unsound extraction of both living and non-living resources, and land management and use practices have hampered economic development, and degraded the quality of life for many people, especially the poor and other marginal groups. They have also failed to take advantage of the many opportunities for sustainable development that arise from the environmental and natural resource assets of the Republic of the Marshall Islands (RMI).

ADB's strategic priorities for the RMI, as articulated in the CSPU, are: (i) enhanced public sector productivity, including improved access to basic social services; (ii) enhanced environment for private sector investment, job creation, and growth; and (iii) strengthened public sector governance. Importantly for the last priority, traditional and modern structures of authority and governance uneasily coexist in the RMI. Overlap and tension between them are inevitable, and lead to lack of coordination, under-performance and litigation. The Constitution tries to address the problem by recognizing traditional ranks and interests in land, but in so doing hampers the natural evolution of these concepts under modernizing influences. In the RMI, there is no formal system of land use and development regulations. There are no comprehensive land use plans, zoning or building codes. Much of this has to do with the feudal system of land ownership, whereby the Iroij or tribal chiefs and their Alap (land managers) control the wetos (land holdings – stretching from ocean to lagoon) in the islands. The dri Jerbal are tenant workers of the land who live and work on the land at the pleasure of the Iroij. Even today, except for Majuro and Ebeye, agricultural and marine subsistence is the mainstay of the islands, and duties are assigned by the Alap. Inheritance is matrilineal (passed through the mother's family). Despite increasing Westernization and the introduction of a moneyed economy, social status still comes as much from one's kinship as it does from one's own achievements. Iroij continue to wield a great deal of authority over land ownership and usage. In practice, ownership and rights to the land and its products are based on a complicated system of titles, rank, inheritances, usufruct rights and land categories, with several individuals being in "possession" of any one piece of land at the same time, but with ultimate control being in the hands of the Iroij. During the Japanese colonial period a new concept was introduced where the Iroij maintained control over the land while the Alap owned the trees planted on the land. This system continues to the present day.

In a society that culturally accepts the role and power of the Iroij, land use planning, zoning and building codes are perceived by many to be transferring much of that power to Government, giving it substantial control over the use of land. Under Marshallese traditional custom, the Iroij holds the "ultimate ownership rights" to lands in his/her possession and the Alap and dri Jerbal occupy the land at the discretion of the Iroij. Thus the Iroij have ultimate control of such things as land tenure, resource use and distribution, and dispute settlement. The RMI constitution has added a further requirement that the signatures of all three parties are required before any land use changes or leases are validated. To accomplish this can be a protracted process. Even where an agreement and support for a new activity or venture is reached, if an Alap dies there is no guarantee that the successor will share the same views, especially where benefits and benefit distribution to the next line of succession are viewed as unsatisfactory. This uncertainty is further exacerbated as population and land pressure increase. Non-lease type agreements, such as establishing a nursery or planting to a new crop, are especially vulnerable under this situation. Such uncertainties over land can discourage development requiring investment in labor and cash in the land, especially where disputes and uncertainties exist.

But in the last fifty years much has also changed. The population has increased over four-fold and more than two-thirds of the people are now living in urban centers. The economy has become highly monetized and great disparities of income, wealth and welfare have emerged. The sharpest costs of development—landlessness, overcrowding, poor education and health, joblessness and a slide into prostitution and petty crime—fall on the poorer urban people (and among them, with particular force upon women and children), while rural dwellers are deprived of economic opportunity. The benefits of development - commercial opportunities, good houses, overseas vacations, access to good schools and hospitals, financial security—go mainly to the already well off.

Today practically all land is privately owned. As recently as 1988 the Public Lands and Resources Act took the basic definition of public lands as those owned or maintained by the Japanese Government during the Japanese administration, but the latter have since been returned to the traditional owners. However in many cases there are disputes as to who have ownership of some tracts of land, plus some owners are seeking compensation for Government use of the land while it was in public ownership. The Public Lands and Resources Act also defines all lands below mean high water mark as belonging to the Government. The public may install fish weirs and traps and have the right to erect these as recognized by customary law, and also have fishing rights on, and in water over reefs where the general depth of water is less than 4 feet at low tide, as recognized by customary law. The Act also acknowledged the traditional and customary right of the individual landowner, clan or municipality to control the use of, or material in, marine areas below the high water mark or to fill in, erect, construct and, with permission, maintain piers, buildings or other construction on or over the adjacent water or reef, subject to the inherent rights of ownership of the government.

Recently, in response to a perceived uncertainty over the ownership of reclaimed land, the Government has confirmed its commitment to exercising its rights of ownership of land below the high water mark, considering this is preferable to exercising rights of compulsory acquisition of existing land above the high water mark. Land owners have traditionally viewed waste as useful material that can be used to extend the extremely limited and therefore highly valued land area, by reclaiming adjacent reef flats. Some Iroij and Alap have entered into agreements with Government to assist in the disposal of the ever increasing amounts of urban waste, using it to reclaim areas adjacent to their land. In return they are given usage rights, perceived as ownership, of the reclaimed land. While this practice may have presented few environmental problems in the past, the waste arising from modern imported materials can present serious health and environmental problems. Placement of waste has also not

been engineered to allow for structural stability. This is most particularly a concern in areas subject to storm surges and other extreme climatic events. Most Ebeye and Majuro urban residents have little or no claim to land on those two atolls, having moved from the Outer Islands and having been allowed to build houses and to establish residence by Ebeye and Majuro land owners and land managers. The latter are informally reimbursed for this permission by occasional rent payments. The majority of residents may therefore not consider waste disposal to be their concern, but rather the concern of the few land owners and land managers. The poorest of the urban poor, who have little if any claim to urban atoll land, are the most vulnerable to the low standard of waste management practices.

The principal policy instrument guiding sustainable development of the Marshall Islands for the next 15 years is the Strategic Development Plan (SDP) 2003-2018 or Vision 2018. The SDP has two key goals related to environmental sustainability policy, namely: (i) developing a regulatory system that can be enforced with a high degree of compliance at all levels in to achieve the sustainable development of our natural resources while protecting our environment from any adverse impacts; and (ii) strengthening the relevant institutions and improve the procedural mechanisms so as to be able to secure the optimum support from international and regional efforts in minimizing the adverse impact of climate change.

The National Environmental Protection Act 1984 established the National Environmental Protection Authority, the primary purpose of which is to preserve and improve the quality of the environment through such regulatory means as environmental impact, solid waste and earth moving regulations. The Coast Conservation Act 1988 provides for protection of coastal and adjacent marine areas, including preparation and enforcement of coastal zone management plans that include consideration of living resources, environmental impact assessment procedures and permits for a proposed development activity.

The legislation of greatest relevant to the present proposal is the Planning and Zoning Act 1987. It assigns authority to Local Government Councils to plan the use of land and water areas, promote the health, safety and general welfare of people, create residential, commercial, industrial and resort zones in municipal areas in order to lessen congestion and secure safety from fire and other hazards, demarcating land solely for use as cemeteries and prohibiting the use of any other lands for cemeteries, regulation and control of the construction, size and location of buildings and adjacent areas, prevention of overcrowding of land, and formulate rules and regulations establishing minimum standards for construction of buildings or classes of buildings (i.e. a "building code"). In addition, Local Government Councils may, if there is no conflict with national legislation and with the approval of the National Government, establish local regulations (ordinances).

The Planning and Zoning Act also establishes a National Planning Commission, a Government Chief Planner and a Marshall Islands Building Code, plus a Planning Office and a Director of Planning under each Local Government Council. To date none of these elements has materialized. As a result, land use planning and zoning is effectively non-existent, meaning there is ad hoc and often conflicting use of land, with activities often conducted in areas where environmental impacts will be higher than might be the case in other locations. Severe limitations on the Government's access to land not only leads to ad hoc placement of infrastructure, but also delays and increases the costs of provision of services such as water supply, and management of solid waste and waste water. The absence of effective controls on siting, design and construction of buildings has adverse consequences not only for the environment but also for human health, safety and well-being.

Given the highly dynamic nature of the RMI economy, environment and society a flexible approach to land use planning, and to resource and environmental management is to be preferred. Such activities are best undertaken close to the intended beneficiaries, to the key assets being managed and to the source of resource inputs, including funding. This highlights the need to implement the key provisions of the Planning and Zoning Act that allow for the increased involvement of Local Government in environmental and natural resource management, and in related activities such as land use planning, regulation of construction and other development activities, and delivery of services related to water supply and waste and wastewater management. While devolution of many responsibilities to Local Government is appropriate, concomitant requirements are that Local Governments have the ability to prepare and implement workable policies and procedures, have adequate human, financial and other resources and are entrusted with the necessary powers to plan and manage for and, as a last resort, enforce the achievement of good environmental, social and economic outcomes.

Improved environmental and related performance in RMI requires a more committed effort to consult with stakeholders from the community and the private sector, using best practice methods. This would help remove the false perceptions, destroy the antagonism and build the mutual respect and confidence that unpins effective and sustained cooperation between all stakeholders. One of the key barriers to gaining improved environmental and related outcomes is the lack of awareness amongst the public, and to some extent the private sector, of the intentions and procedures of Government. Government is perceived to be autocratic, insensitive to traditional and customary rights and practices and uncommitted to good practices in raising awareness and consultation. The consequences often come in the form of a standoff between Government on the one hand and landowners and/or leaseholders on the other. Sometimes the public at large are antagonistic and uncooperative. A best practice approach to awareness raising and consultation, using where appropriate traditional methods which underpinned respect and cooperation in the past, would go a long way towards giving greater effect to the existing environmental and related policies, laws, regulations and financial expenditures made by Government.

This barrier can be addressed if the current enabling legislation for land use planning and building regulation is implemented through initiatives at Local Government level. For example, the inappropriate location of many toilets and grave sites and of agricultural activities (e.g. piggeries and chicken raising) could be addressed by demonstrating that it is in the mutual interest of landowners, leaseholders and the wider communities to have a more rational pattern of land use, with security of title.

As another example, many studies have proposed that a single agency be established to manage solid waste in the urban centers and in 2004 legislation was introduced to the Nitijela to establish a single authority responsible for managing solid waste. However, the Bill was postponed, despite widespread support from the public and the private sector. Any solution will require careful planning, taking into account social, economic and environmental considerations. Local Government will be a key player, as evident by the recent appointment of the Major of Majuro Atoll as the Chair of the new Solid Waste Task Force.

**b. Goal and purpose:**

The overall goal of the project is to help give effect to the RMI Vision 2018, the Planning and Zoning Act 1987, the Coast Conservation Act 1988 and other national policy and legislation by assisting relevant levels of Government in the RMI to develop policies and procedures, and build capacity for land use planning, zoning and regulation of building location, design and construction. The recently prepared RMI Standard Disaster Mitigation Plan (SDMP), approved by both the RMI Government and by the US Federal Emergency Management Agency (FEMA), noted that the remoteness of island communities in the RMI, and the limited resources to deal effectively with a major disaster, exacerbates the vulnerability of the RMI and reinforces the need for effective risk reduction strategies such as zoning laws and building regulations to be developed and enforced (RMI Standard Disaster Mitigation Plan, 2005). While the SDMP calls for enforcement of plans and codes, including building codes, the fact that such codes are currently non-existent severely handicaps the effectiveness of the SDMP.

The assistance will focus on identifying and implementing strategies, approaches and mechanisms for land use planning, zoning and regulation of construction and other development activities that achieve an appropriate and acceptable balance between delivering the desired economic, social and environmental outcomes and retaining traditional practices related to land tenure and use. This will necessitate National and Local Government, the private sector and communities working together to identify sustainable and effective methods ensuring traditional practices are not compromised by attempts to ensure more rational and compatible uses of land or by building requirements that ensure public safety and well being, maintain environmental quality, and allow efficient and effective delivery of community services such as water, electricity and waste disposal. By working in cooperation with other relevant parties, the assistance will also ensure that the agencies and individuals with responsibilities for land use planning, zoning and building regulation develop the capacity and capabilities to fulfill their mandate to manage community and island development in ways that are socially acceptable, environmentally sound and economically prudent.

Specifically, the assistance will serve to:

- (i) Document and describe the current legislative, regulatory and traditional regimes and institutional arrangements for land tenure, land use planning, zoning and building regulation and identify gaps as well as opportunities for increased harmonization;
- (ii) Design and implement ongoing participatory processes for identifying and implementing sustainable and effective policies and procedures that ensure traditional practices are not compromised by attempts to ensure more rational and compatible uses of land or by building requirements;
- (iii) Identify and document past and current land use management practices in the RMI that have proven successful in harmonizing traditional and modern practices in land use planning, in the management of the environment and natural resources and in meeting other relevant needs of society;
- (iv) Build on the understanding gained from the above activities and work with all relevant stakeholders to prepare policies and procedures, and undertake initial capacity building, for land use planning, zoning and regulation of building in at least two Local Government jurisdictions, including Majuro Atoll and a remote Outer Island;
- (v) Prepare guidelines for use by Local Government Councils and other stakeholders, when preparing and implementing policies, plans, regulations and other instruments and procedures for land use planning, zoning and building regulation;
- (vi) Assess the requirements for enhancing the capacity of Local Governments so they are able to use best practices in land use planning, zoning and building regulation and achieve the targets set for more rational and compatible uses of land and meeting building standards that ensure public safety and well being, maintain environmental quality, and allow efficient and effective delivery of community services such as water, electricity and waste disposal;
- (vii) Prepare recommendations to National Government for strengthening national policy and legislation in ways that will assist Local Government and traditional land owners and users to implement more rational and compatible uses of land and also building requirements that ensure public safety and well being, maintain environmental quality, and allow efficient and effective delivery of community services such as water, electricity and waste disposal;
- (viii) Prepare a concept for ADB Loan as part of an updated CSPU for the RMI; and
- (ix) Provide guidance for the replication of best practices in the form of further application to environmental project and program design in the Pacific region in support of the ADB's new Pacific Strategy, 2005 to 2009.

**c. Components and outputs:**

The proposed work will be carried out in the following sequence:

- (i) In the first instance, the entire fifteen month work program will be initially discussed in detail with all relevant, interested parties (Cabinet, Office of the President, relevant central Government departments, Outer Island Mayors and Councilors, Ministry of Internal Affairs (MIA), the Environmental Planning Agency (EPA), the Economic Policy, Planning and Statistics Office (EPPSO), the Office of Environmental Protection and Policy Coordination (OEPPC), Chamber of Commerce, churches, land owners and land managers, women's groups, other NGOs, heads of relevant urban and rural communities) together with the Marshall Islands Council of NGOs (MICNO) and the Lead Specialist for the TA. MIA and

EPPSO, assisted by the Lead Specialist, will then prepare a revised work program for endorsement by the Minister of Internal Affairs, by Cabinet, and by ADB. MIA and EPPSO will be considered the co-lead implementing agencies for this activity. This proposed activity has already been discussed with relevant stakeholders;

- (ii) The TA team, comprising domestic and international specialists in land use planning, zoning, and building regulation in a the context of a small island developing state with strong traditional practices with respect to land tenure and use, will:
- document and describe the current legislative, regulatory and traditional regimes and institutional arrangements for land tenure, land use planning, zoning and building regulation and identify gaps as well as opportunities for increased harmonization;
  - design and implement ongoing participatory consultative processes for identifying and implementing sustainable and effective policies and procedures that ensure traditional practices are not compromised by attempts to ensure more rational and compatible uses of land or by building requirements;
  - using the same participatory consultative processes, identify, recommend and receive approval for the selection of at least two Local Government jurisdictions, including Majuro Atoll and a remote Outer Island, to be used as case studies in the TA;
  - identify and document past and current land use management practices in the RMI that have proven successful in harmonizing traditional and modern practices in land use planning, in the management of the environment and natural resources and in meeting other relevant needs of society;
  - build on the understanding gained from the above activities and work with all relevant stakeholders to prepare policies and procedures, and undertake initial capacity building, for land use planning, zoning and regulation of building in at least two Local Government jurisdictions, including Majuro Atoll and a remote Outer Island;
  - prepare best practice guidelines for use by Local Government Councils and other stakeholders, when preparing and implementing policies, plans, regulations and other instruments and procedures for land use planning, zoning and building regulation;
  - assess the requirements for enhancing the capacity of Local Governments so they are able to use best practices in land use planning, zoning and building regulation and achieve the targets set for more rational and compatible uses of land and meeting building standards that ensure public safety and well being, maintain environmental quality, and allow efficient and effective delivery of community services such as water, electricity and waste disposal;
  - prepare recommendations to National Government for strengthening national policy and legislation in ways that will assist Local Government and traditional land owners and users to follow best practice guidelines when preparing and implementing policies, plans, regulations and other instruments and procedures for land use planning, zoning and building regulation;
  - prepare a concept for ADB Loan that includes a fully detailed plan of action for developing policies and procedures, and building capacity in all RMI Local Government jurisdictions for land use planning, zoning and regulation of building location, design and construction;
- (iii) An appropriate RMI NGO will independently review, monitor and ultimately evaluate and report on the above work and outcomes;
- (iv) A representative group of key stakeholders will report on the exercise and outcomes to Cabinet, to relevant National and Local Government officials and to other relevant stakeholders; and
- (v) Depending on overall outcomes, a summary report will be published and presented to the region's leadership.

**d. Expected results and deliverables:**

The overall expected outcomes of the assistance include:

- (i) Best practice guidelines for use by Local Government Councils and other stakeholders that harmonize traditional and modern values and practices when implementing policies, plans, regulations and other instruments and procedures for land use planning, zoning and building regulation;
- (ii) Detailed requirements for enhancing the capacity of Local Governments so they are able to use best practices in land use planning, zoning and building regulation;
- (iii) Recommendations to National Government for strengthening national policy and legislation in ways that will assist Local Government and traditional land owners and users to follow best practice guidelines when preparing and implementing policies, plans, regulations and other instruments and procedures for land use planning, zoning and building regulation; and
- (iv) A concept for ADB Loan that includes a fully detailed plan of action for developing policies and procedures, and building capacity in all RMI Local Government jurisdictions for land use planning, zoning and regulation of building location, design and construction;

**e. Social or environmental issues or concerns:** The proposed TA aims to address: (i) endemic social, cultural and institutional barriers to achieving more rational and compatible uses of land and to designing, constructing and maintaining building in ways that ensure public safety and well being, maintain environmental quality, and allow efficient and effective delivery of community services such as water, electricity and waste disposal; (ii) builds the capacity of selected Local Governments and other stakeholders; and (iii) prepares for a more comprehensive program of assistance to develop policies and procedures, and build capacity for land use planning, zoning and regulation of building location, design and construction in all Local Government jurisdictions in the RMI.



**f. Plans for disseminating results/deliverables:**

The entire activity will be conducted in a highly participatory manner. Information on the impact of current status and trends will be disseminated to participants and stakeholders. An independent NGO will monitor, review, evaluate and report on the activity and its results. Participants will be encouraged to design their own solutions. Both written and verbal reports be presented by a representative group of the participants to Cabinet, to a meeting of senior National and Local Government officials, and as feedback to all stakeholders who participated in the project. Again, depending on outcomes ADB will provide financing for improved layout and summary presentation for dissemination to all governments in the region. The pilot case studies could be presented to the ADB Annual Meeting of Pacific DMC Governors and to other regional fora as a model for addressing endemic social, cultural and institutional barriers to achieving more rational and compatible uses of land and to designing, constructing and maintaining building in ways that ensure public safety and well being, maintain environmental quality, and allow efficient and effective delivery of community services such as water, electricity and waste disposal.

**7. Proposed executing/implementing agencies:**

The Ministry of Internal Affairs and EPPSO will be the co-executing agencies. The TA will be managed in Majuro, RMI by a staff member of one of the executing agencies, assisted by the Lead Specialist. The TA will be managed in Manila by the proponent, Edy Brotoisworo, Senior Environment Specialist, assisted by the Lead Specialist in the RMI. Project costs include allowance for subproject monitoring, and reporting by an independent NGO based in Majuro. The Lead International Specialist, assisted by a Marshallese counterpart, will be responsible for coordinating and finalizing the detailed work program, for all project administration and for all progress reports.

**8. Nature/extent of government/beneficiary involvement in identifying or conceptualizing the assistance:**

All relevant agencies, both in the National and Local Governments, and outside of Government, have had an ongoing involvement in discussing and developing this proposal, including at a National Dialogue.

**9. Timetable for assistance design, processing, and implementation**

- a. Year included in CSP, CSP Update, SCSP, SCSP update, or interregional work plan: 2006
- b. Expected date of submission for approval
  - Lending:
  - Nonlending (project preparatory): May 2006
  - Nonlending (other than project preparatory):
- c. Period and duration of assistance
  - Lending:
  - Nonlending: November 2006 to February 2007

**10. Financing Plan**

- a. For lending
  - Ordinary capital resources: \$
  - Asian Development Fund: \$
  - Other: \$

If cofinancing is required, indicate amount and sources sought: \$ \_\_\_\_, from \_\_\_\_\_.

If known, provide cost estimates and financing arrangements.

Source	Amount (\$)
ADB Financing	
Government Financing	
Other Financing	
<b>Total Cost</b>	
Source:	

- b. For nonlending
  - No resources required, other than ADB staff
  - ADB's administrative budget: \$
  - Grant TA funds
  - Other:

If cofinancing is required, indicate amount and sources sought: \$ \_\_\_\_, from \_\_\_\_\_.

If known, provide cost estimates and financing arrangements.

<b>Source</b>	<b>Amount (\$)</b>
ADB Financing	
Government Financing	
Other Financing	
<b>Total Cost</b>	
Source:	

# Harmonizing and Strengthening Traditional and Modern Methods for Coastal Protection and Erosion Control

## Concept Paper

**Date:** 10 May, 2005

<p><b>1. Type/modality of assistance</b> (double-click on appropriate box)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lending             <ul style="list-style-type: none"> <li><input type="checkbox"/> Project loan</li> <li><input type="checkbox"/> Program loan</li> <li><input type="checkbox"/> Sector loan</li> <li><input type="checkbox"/> Sector development program loan</li> <li><input type="checkbox"/> Other:</li> </ul> </li> <li><input type="checkbox"/> Nonlending             <ul style="list-style-type: none"> <li><input type="checkbox"/> Project preparatory</li> <li><input checked="" type="checkbox"/> Other than project preparatory                 <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Economic, thematic, and sector work</li> <li><input checked="" type="checkbox"/> Institutional development</li> <li><input type="checkbox"/> Other:</li> </ul> </li> </ul> </li> </ul>		
<p><b>2. Assistance Focus</b></p> <p>a. If assistance focuses on a particular sector or subsector, specify the Sector: Water Supply, Sanitation and Waste Management. Subsector: Waste Management</p> <p>b. For project preparatory and lending, classification</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Targeted Intervention</li> <li><input checked="" type="checkbox"/> General intervention</li> </ul> <p>c. Key thematic area(s)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Sustainable Economic Growth</li> <li><input checked="" type="checkbox"/> Inclusive Social Development</li> <li><input type="checkbox"/> Gender and Development</li> <li><input checked="" type="checkbox"/> Environmental Sustainability</li> <li><input type="checkbox"/> Other:</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Governance</li> <li><input type="checkbox"/> Regional Cooperation</li> <li><input type="checkbox"/> Private Sector Development</li> <li><input checked="" type="checkbox"/> Capacity Development</li> </ul> </td> </tr> </table>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Sustainable Economic Growth</li> <li><input checked="" type="checkbox"/> Inclusive Social Development</li> <li><input type="checkbox"/> Gender and Development</li> <li><input checked="" type="checkbox"/> Environmental Sustainability</li> <li><input type="checkbox"/> Other:</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Governance</li> <li><input type="checkbox"/> Regional Cooperation</li> <li><input type="checkbox"/> Private Sector Development</li> <li><input checked="" type="checkbox"/> Capacity Development</li> </ul>
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<p><b>3. Coverage</b></p> <p><input checked="" type="checkbox"/> Country                      <input type="checkbox"/> Subregional                      <input type="checkbox"/> Interregional</p> <p><input type="checkbox"/> Internal policy development</p>		
<p><b>4. Responsible division/department:</b> PAHQ, PARD</p>		
<p><b>5. Responsible ADB officer(s):</b> Edy Brotoisworo</p>		
<p><b>6. Description of assistance(s)</b></p> <p><b>a. Background/linkage to country/regional strategy:</b></p> <p>Due to the low elevation of land in the MI, and the concentration of development in the coastal areas of all islands, extreme high tides, storm surges and the gradual rise in sea level, due to global climate change, all present a high risk to the RMI. The mean tidal range for Majuro is 1.13 meters while the mean spring tide range is 1.62 meters. Occurrences of extreme high sea level are frequent. Daily mean sea level has been as high as 30 cm above mean sea level and as low as 40 cm below mean sea level. When combined with the diurnal tide these extremes become close to 1 m deviations from mean sea level. Such high sea levels contribute to coastal flooding and to greatly accelerated erosion. Also of great, but somewhat longer-term concern is the clear evidence of a systematic rise in sea level in recent decades. The rate of approximately 2 cm per decade observed for Majuro is</p>		

consistent with global rates of sea-level rise over the last century. However, the rate of sea-level rise will accelerate over the coming decades. When even the current interannual variability and extremes are superimposed on these higher sea levels, the results suggest that high tides in excess of 1.25 m above current mean sea level will not be uncommon.

Stable high pressure systems north-east of Wake Island or east of the Marshall Islands can create higher-than-normal sea levels which will cause flooding of low-lying areas if they coincide with a spring tide, or with higher wave action. Such high pressure systems are common and have affected the atolls of the Marshall Islands on numerous occasions - the 1979, 1989, 1990 and 1991 floods on Majuro Atoll, for example (Spennerman, 1988). In late November 1979 a subtropical high pressure system ("Alice") had formed some 2000 miles east of the Marshall Islands, creating higher than normal sea-level at its perimeter, as well as creating a storm surge, sent out as a swell with a wave amplitude of over 6m. The first set of waves inundated parts of the D-U-D area in the morning of 26 November 1979. Since the weather forecast came too late, there was no warning and a great number of personal belongings were destroyed. During the night of 27 to 28 November a second inundation occurred (Ginoza 1979b), and a third inundation took place on 4 December when a third storm hit Majuro, this time accompanied by gale-force winds and a 20 foot surf. Before the second storm surge hit the atoll, some 4000 residents of the already devastated D-U-D area had been warned well ahead and had relocated themselves to Laura. On the morning of 28 November some 80% of the affected area was still covered by seawater. This high tide and flooding was made worse where the waters pushed by the strong winds had been channeled and funneled into the embayments of the former inlets now barred by causeways, and had washed over the causeways and adjacent reclaimed areas. The flooding event did not cause loss of life, although several people were injured. The effects of the inundations were destruction of housing and personal belongings, the inundation of septic tanks and subsequent spread of raw sewerage. Majuro was declared a disaster area, with quarantine measures enforced to prevent the spread of diseases. Some 5000 people were relocated into tent cities on Rairok Islet, a narrow strip of land in the southwestern section of the atoll. The total damage to housing and belongings was estimated to be \$26 million during the first set of waves, and another \$4 million as a result of the second set of inundations.

A recent study (SOPAC, 1997) of Majuro Atoll, but with implications for all of the RMI, reported that most ocean and lagoon coasts are erosional, with a total length of more than 100 kilometres. Shoreline retreat of 10 to 20 m has occurred in some places. In recent years coastal erosion from Djarrit (Rita) to Laura has been largely induced by human activity for coastal development, including aggregate excavating, landfilling, and construction of groynes, sea walls, artificial channels and causeways. The lagoon erosion on the west part of the south rim and Laura has been induced by development on the east rim and the eastern part of the south rim. Distribution of the ocean and lagoon beachrock indicate that the islands on the south rim were connected to each other in the past – historical records also show there was a continuous very long island from Delap to Laura before 1905, with the openings on the south rim of the atoll being breach mainly as a result of cyclone waves in 1905. Openings on the south rim, especially excavating channels, will induce major erosion channels. Major recommendations from the study included cessation of aggregate dredging from Djarrit to Rairok; prohibit excavation of aggregate from the beach and reef flat; solid waste management through landfilling and reclamation; construct necessary sloping sea walls on ocean shore; improve and reform construction on the lagoon coast; reopen passages on the south and east rims; and implement laws and regulations and increase awareness of the scientific and technical issues and solutions. An earlier study (Pilkey, 1990) came to many of the same conclusions.

Coastal erosion is caused both by natural and human factors and activities. Factors that cause coastal erosion include: a) sea-level rise, b) dredging, c) channel blasting, d) inappropriate design of landfills, and e) land reclamation. Storm surges, high waves, sea level rise, subsidence, and tsumanis are natural processes that contribute to overwash and erosion of coastal shorelines. Without intact stable shorelines, the integrity of local infrastructure such as roads, airports, buildings, and residences may be threatened. Furthermore, significant salt water intrusion may infiltrate the groundwater and degrade drinking water sources, wetlands, and agriculture (e.g., taro patches). Shoreline processes can maintain the integrity of tropical islets and islands and are influenced by such factors as coastal hydrology, deposition, storm patterns, vegetation, and coral reefs. Of these factors, humans may have a positive role in preserving vegetation and coral reef communities to maintain intact shoreline processes. Intact native vegetation communities are ideal for stabilizing shorelines since native plants have evolved to survive in tropical environments, tolerating tropical heat, humidity, salt water, extreme sunlight, and storms. Native vegetation communities function as soil binders, maintaining coastal berms and forests. These communities are part of the dynamic coastal process, well adapted to conforming to shifting shorelines. Alternatively, seawalls are static, immobile objects that do not conform to the ebb and flow of shorelines. Sea walls may become undermined by shifting shorelines and no longer function. Furthermore, seawalls and other similar construction activities often disrupt or displace native vegetation communities. Intact coral reef communities are also ideal for protecting shorelines. Coral reefs function as buffers, dispersing wave energy that would otherwise contribute to the erosion of coastal shorelines. However, coral reefs in Majuro atoll are susceptible to direct destruction and sedimentation from poorly designed dredging and filling practices. Also, alien species, such as invasive macro algae may degrade reefs by growing over coral colonies and blocking sunlight. Other negative impacts that contribute to the degradation of coral reefs include pollution, anchor damage, and coral bleaching.

The principal policy instrument guiding sustainable development of the Marshall Islands for the next 15 years is the Strategic Development Plan (SDP) 2003-2018 or Vision 2018. The SDP has two key goals related to environmental sustainability policy, namely: (i) developing a regulatory system that can be enforced with a high degree of compliance at all levels in to achieve the sustainable development of our natural resources while protecting our environment from any adverse impacts; and (ii) strengthening the relevant institutions and improve the procedural mechanisms so as to be able to secure the optimum support from international and regional efforts in minimizing the adverse impact of climate change.

Within the SDP are two key goals of the environmental sustainability policy and these are a) developing a regulatory system that

can be enforced with a high degree of compliance at all levels in to achieve the sustainable development of our natural resources while protecting our environment from any adverse impacts; and b) strengthening the relevant institutions and improve the procedural mechanisms so as to be able to secure the optimum support from international and regional efforts in minimizing the adverse impact of Climate Change.

In order to achieve the goals set out under the environmental sustainability policy, the objectives set out are to: a) achieve maximum benefit from all Environmental global conventions through active commitment and participation, b) 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, c) enhance the level of awareness and commitment among all people in the community to contribute toward the minimization of environmental degradation, d) achieve the highest degree of compliance with environmental laws and regulations and e) reinvigorating out culture and traditional environmental conservation practices to harmonize development with environmental sustainability. A series of key performance indicators were identified as means to measure progress.

The “Coast Conservation Act 1988” provides for protection and preservation of the coast from sea erosion, or encroachment of the sea, in relation to development activities related to buildings; depositing of wastes or other materials from outfalls, vessels etc.; removal of sand, coral, shells, vegetation, sea grass etc.; dredging, filling, land reclamation, mining or drilling for mineral within 25 feet landward of the mean high water line and 200 feet seaward of the mean low water line. The Act also provides for coastal zone management plans including consideration of living resources, environmental impact assessment procedures and permits for a proposed development activity.

Development and natural changes placing increasing pressure on coastal systems. The enforcement of EPA and other regulations have so far been largely ineffective in curbing inappropriate dredging, sandmining, and development of coastal zones. This has contributed to the increased rate of coastal erosion particularly in those area with little or no erosion control. Current designs of landfills tend to aggravate coastal erosion as they tend to change wave patterns. There are virtually no trees around shorelines and coast to protect the land. Considerable land has been lost through coastal erosion, e.g. picnic area in Laura. There is a need to focus on methods that are appropriate in scale and in levels of technology, including joint top-down and bottom up (e.g. community and household) approaches. Some high valued assets may need hard protection, but there is also a need to avoid the adverse side effects of such systems, and ensure they are sustainable, economically viable and culturally appropriate solutions. Unless concerted action is taken the growing population will have to survive with less land area for development, contamination of groundwater due to intrusion of seawater and increased tension between those who want to control the land, impeding development on the limited available land.

The goal of EPA’s Coastal and Land Conservation and Management Program is to conserve the environmental value of the coastal zones of the RMI by minimizing environmental degradation. It does this by regulating and controlling development activities in order to balance social and economic development with environmental conservation and by facilitating better decision-making and policy development. The EIA to considered a valued decision-making tool and is now an integral part of any major development in the RMI. The Program is developing island--based plans for managing the uses and development of the coastal zone, in line with balancing environmental, social and economic needs.

**b. Goal and purpose:**

The overall goal of the project is to identify both traditional and modern means of coastal protection and erosion control that are appropriate for current and ongoing use in the RMI, and to encourage and demonstrate the use of such soft (e.g. land use planning and zoning; effective regulation of extraction of sand and gravel; replanting and nurturing of native shoreline vegetation) and hard (e.g. sloping shoreline armoring) options in both urban centers and the Outer Islands. The focus will be on economically viable, socially acceptable and environmentally sound options that harmonize both traditional and modern methods of coastal protection and erosion control, on systems that reflect the differences in the location where they will be applied (e.g. remote outer islands; urban centers), and on systems that are replicable beyond the areas in which they are demonstrated, allowing formulation of lessons learned, success factors and best practice guidelines for use elsewhere in the RMI and in the Pacific region.

Specifically, the assistance will serve to:

- (i) Document and describe the current legislative, regulatory, and institutional regimes and traditional and modern practices for coastal protection and erosion control and assess their past and current performance as well as their suitability to deliver sustainable solutions in the future;
- (ii) Design and implement ongoing participatory processes for identifying and implementing sustainable and effective policies and procedures that use best practices in coastal protection and erosion control, based on appropriate choices of traditional and modern systems;
- (iv) Build on the understanding gained from the above activities and work with all relevant stakeholders to prepare policies, regulations and procedures, and undertake pilot demonstrations and capacity building for coastal protection and erosion control in at least one urban center, one sub-centre and one remote Outer Island;
- (v) Prepare coastal protection and erosion control guidelines for use by Local Government Councils and other stakeholders;
- (vi) Assess the requirements for enhancing the capacity of Local Governments so they are able to use best practices in coastal protection and erosion control;
- (vii) Prepare recommendations to National Government for strengthening national policy and legislation in ways that will assist

- Local Governments and traditional land owners and users to undertake more efficient and effective means of coastal protection and erosion control;
- (vii) Prepare a concept for ADB Loan as part of an updated CSPU for the RMI; and
  - (viii) Provide guidance for the replication of best practices in the form of further application to environmental project and program design in the Pacific region in support of the ADB's new Pacific Strategy, 2005 to 2009.

**c. Components and outputs:**

The proposed work will be carried out in the following sequence:

- (i) In the first instance, the entire fifteen month work program will be initially discussed in detail with all relevant, interested parties (Cabinet, Office of the President, relevant central Government departments, Outer Island Mayors and Councilors, Ministry of Public Works (MPW), the Environmental Planning Agency (EPA), the Economic Policy, Planning and Statistics Office (EPPSO), the Office of Environmental Protection and Policy Coordination (OEPPC), Chamber of Commerce, churches, land owners and land managers, women's groups, other NGOs, heads of relevant urban and rural communities) together with the Marshall Islands Council of NGOs (MICNO) and the Lead Coastal Management Specialist for the TA. EPA, assisted by the Lead Coastal Management Specialist, will then prepare a revised work program for endorsement by the Minister in Assistance to the President, by Cabinet, and by ADB. EPA will be considered the lead implementing agency for this activity. This proposed activity has already been discussed with relevant stakeholders;
- (ii) The TA team, comprising domestic and international specialists in costal management and protection in the context of a small island developing state with strong traditional practices with respect to land tenure and use, will:
  - document and describe the current legislative, regulatory, and institutional regimes and traditional and modern practices for coastal protection and erosion control and assess their past and current performance as well as their suitability to deliver sustainable solutions in the future;
  - design and implement ongoing participatory processes for identifying and implementing sustainable and effective policies and procedures that use best practices in coastal protection and erosion control, based on appropriate choices of traditional and modern systems;
  - using the same participatory consultative processes, identify, recommend and receive approval for the selection of at least one urban center, one sub-center and one remote Outer Island to be used as case studies in the TA;
  - build on the understanding gained from the above activities and work with all relevant stakeholders, especially EPA and relevant Local Governments, to prepare policies, regulations and procedures, and undertake pilot demonstrations and capacity building for coastal protection and erosion control in at least one urban center, one sub-center and one remote Outer Island;
  - prepare coastal protection and erosion control guidelines for use by Local Government Councils and other stakeholders;
  - assess the requirements for enhancing the capacity of Local Governments so they are able to use best practices in coastal protection and erosion control;
  - prepare recommendations to National Government for strengthening national policy and legislation in ways that will assist Local Governments and traditional land owners and users to undertake more efficient and effective means of coastal protection and erosion control
  - prepare a concept for ADB Loan as part of an updated CSPU for the RMI, including a fully detailed plan of action for developing policies and procedures, undertaking priority coastal protection and erosion control, and building necessary capacity in all RMI Local Government jurisdictions;
  - provide guidance for the replication of best practices in the form of further application to environmental project and program design in the Pacific region in support of the ADB's new Pacific Strategy, 2005 to 2009.
- (iii) An appropriate RMI NGO will independently review, monitor and ultimately evaluate and report on the above work and outcomes;
- (iv) A representative group of key stakeholders will report on the project and outcomes to Cabinet, to relevant National and Local Government officials and to other relevant stakeholders; and
- (v) Depending on overall outcomes, a summary report will be published and presented to the region's leadership.

**d. Expected results and deliverables:**

The overall expected outcomes of the assistance include:

- (i) Best practice guidelines for use by Local Government Councils and other stakeholders on the use of appropriate traditional and modern practices for coastal protection and erosion control;
- (ii) Detailed requirements for enhancing the capacity of Local Governments and other stakeholders so they are able to use best practices in costal protection and erosion control;
- (iii) Recommendations to National Government for strengthening national policy and legislation in ways that will assist Local Government and traditional land owners and users to follow best practice guidelines when implementing coastal protection and erosion control; and
- (iv) A concept for an ADB Loan that includes a fully detailed plan of action for developing policies and procedures, and building capacity in all RMI Local Government jurisdictions, and undertaking high priority coastal protection and erosion control measures in urban centers, sub-centers and Outer Islands.

**e. Social or environmental issues or concerns:**

The proposed TA aims to address: (i) the current high rates of coastal erosion and the high and increasing vulnerability of many coastal areas, by identify and demonstrating best practices in coastal protection and erosion control(ii) builds the capacity of selected Local Governments and other stakeholders; and (iii) prepares for more comprehensive assistance to develop policies and procedures, and build capacity in all RMI Local Government jurisdictions, and undertake high priority coastal protection and erosion control measures in urban centers, sub-centers and Outer Islands.

**f. Plans for disseminating results/deliverables:**

The entire activity will be conducted in a highly participatory manner. Information on the impact of current status and trends will be disseminated to participants and stakeholders. An independent NGO will monitor, review, evaluate and report on the activity and its results. Participants will be encouraged to design their own solutions. Both written and verbal reports be presented by a representative group of the participants to Cabinet, to a meeting of senior National and Local Government officials, and as feedback to all stakeholders who participated in the project. Again, depending on outcomes, ADB will provide financing for improved layout and summary presentation for dissemination to all governments in the region. The pilot case studies could be presented to the ADB Annual Meeting of Pacific DMC Governors and to other regional fora as a model for building capacity and undertaking high priority coastal protection and erosion control measures.

**7. Proposed executing/implementing agencies:**

The EPA will be the executing agency. The TA will be managed in Majuro, RMI by a staff member of EPA, as designate by its Director, and assisted by the Lead Coastal Management Specialist. The TA will be managed in Manila by the proponent, Edy Brotoisworo, Senior Environment Specialist, assisted by the Lead Coastal Management Specialist in the RMI. Project costs include allowance for subproject monitoring, and reporting by an independent NGO based in Majuro. The Lead International Coastal Management Specialist, assisted by a Marshallese counterpart, will be responsible for coordinating and finalizing the detailed work program, for all project administration and for all progress reports.

**8. Nature/extent of government/beneficiary involvement in identifying or conceptualizing the assistance:**

All relevant agencies, both in the National and Local Governments, and outside of Government, have had an ongoing involvement in discussing and developing this proposal, including at a National Dialogue.

**9. Timetable for assistance design, processing, and implementation**

- a. Year included in CSP, CSP Update, SCSP, SCSP update, or interregional work plan: 2006
- b. Expected date of submission for approval
  - Lending:
  - Nonlending (project preparatory): May 2006
  - Nonlending (other than project preparatory):
- c. Period and duration of assistance
  - Lending:
  - Nonlending: November 2006 to February 2007

**10. Financing Plan**

- a. For lending
  - Ordinary capital resources: \$
  - Asian Development Fund: \$
  - Other: \$

If cofinancing is required, indicate amount and sources sought: \$ \_\_\_\_\_, from \_\_\_\_\_.

If known, provide cost estimates and financing arrangements.

Source	Amount (\$)
--------	-------------

ADB Financing	
Government Financing	
Other Financing	
<b>Total Cost</b>	

Source:

- b. For nonlending
  - No resources required, other than ADB staff
  - ADB's administrative budget: \$
  - Grant TA funds
  - Other:

If cofinancing is required, indicate amount and sources sought: \$ \_\_\_\_, from \_\_\_\_\_.  
If known, provide cost estimates and financing arrangements.

<b>Source</b>	<b>Amount (\$)</b>
ADB Financing	
Government Financing	
Other Financing	
<b>Total Cost</b>	



# Enhancing Early Warning Systems for Natural and Other Disasters

## Concept Paper

Date: 10 May, 2005

<p><b>1. Type/modality of assistance</b> (double-click on appropriate box)</p> <p><input type="checkbox"/> Lending</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Project loan</li><li><input type="checkbox"/> Program loan</li><li><input type="checkbox"/> Sector loan</li><li><input type="checkbox"/> Sector development program loan</li><li><input type="checkbox"/> Other:</li></ul> <p><input type="checkbox"/> Nonlending</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Project preparatory</li><li><input checked="" type="checkbox"/> Other than project preparatory<ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Economic, thematic, and sector work</li><li><input checked="" type="checkbox"/> Institutional development</li><li><input checked="" type="checkbox"/> Other:</li></ul></li></ul>										
<p><b>2. Assistance Focus</b></p> <p>a. If assistance focuses on a particular sector or subsector, specify the Sector: Water Supply, Sanitation and Waste Management. Subsector: Waste Management</p> <p>b. For project preparatory and lending, classification</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Targeted Intervention</li><li><input checked="" type="checkbox"/> General intervention</li></ul> <p>c. Key thematic area(s)</p> <table border="0"><tr><td><input checked="" type="checkbox"/> Sustainable Economic Growth</td><td><input checked="" type="checkbox"/> Governance</td></tr><tr><td><input checked="" type="checkbox"/> Inclusive Social Development</td><td><input type="checkbox"/> Regional Cooperation</td></tr><tr><td><input checked="" type="checkbox"/> Gender and Development</td><td><input type="checkbox"/> Private Sector Development</td></tr><tr><td><input checked="" type="checkbox"/> Environmental Sustainability</td><td><input type="checkbox"/> Capacity Development</td></tr><tr><td><input type="checkbox"/> Other:</td><td></td></tr></table>	<input checked="" type="checkbox"/> Sustainable Economic Growth	<input checked="" type="checkbox"/> Governance	<input checked="" type="checkbox"/> Inclusive Social Development	<input type="checkbox"/> Regional Cooperation	<input checked="" type="checkbox"/> Gender and Development	<input type="checkbox"/> Private Sector Development	<input checked="" type="checkbox"/> Environmental Sustainability	<input type="checkbox"/> Capacity Development	<input type="checkbox"/> Other:	
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<input checked="" type="checkbox"/> Environmental Sustainability	<input type="checkbox"/> Capacity Development									
<input type="checkbox"/> Other:										
<p><b>3. Coverage</b></p> <p><input checked="" type="checkbox"/> Country                      <input type="checkbox"/> Subregional                      <input type="checkbox"/> Interregional</p> <p><input type="checkbox"/> Internal policy development</p>										
<p><b>4. Responsible division/department:</b> PAHQ, PARD</p>										
<p><b>5. Responsible ADB officer(s):</b> Edy Brotoisworo</p>										
<p><b>6. Description of assistance(s)</b></p> <p><b>a. Background/linkage to country/regional strategy:</b></p> <p>Current communication with the Outer Islands is based on high-frequency (HF) radios but the National Telecommunications Authority is moving towards a mini-satellite system for communications in the atolls. Jaluit and Kili atolls are the only atolls in the country currently utilizing this system, as they have access to power supply.</p> <p>Overall it is evident that there is a lack of a systematic and country-wide early warning system for natural and other disasters. At present the national government utilizes the national radio station to alert and warn people about impending natural disasters, but this system is not on air for much of the night. There has been no public awareness programs conducted to educate people</p>										

on what to do during and after natural disasters. If early warning systems are adequate they can help minimize damage to the economy and the people.

A study conducted by the DPMA in 2003 highlighted that exposure to the risk of future disasters is relatively moderate in the RMI. However, while exposure to hazards (e.g. storm surges, tropical storms and typhoons, droughts, epidemics, and earthquakes) is moderately low, the country is very vulnerable to a disaster (see table). The impact of a realized threat could be very high because of high population densities on some islands (e.g. Majuro and Ebeye), low elevation, wide dispersal of the atolls over a large area of ocean, the fragile island ecosystems and water systems on which the country is highly dependent for economic survival and human well being, and the economic dependence on tourism. The latter provides 40% of Government revenue, 14% of employment and 19% of GDP (RMI Standard Disaster Mitigation Plan, 2005).

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

Source: DPMA 2003

At present, there are only two systems of SSB radio for use by the Outer Islands: one is used for health clinics and the other for schools. Recently the Marshall Islands Conservation Society submitted to the Government of Japan a grant proposal for Grassroots Human Security Project titled Environmental Radio Network. The project will establish an outer island radio network for exchange of environmental information with and between 9 outer islands. The aim is to operate the radio network to build grassroots awareness and positive-action solutions to environmental issues throughout the Marshall Islands and utilize the SSB radio network to support and build capacity for community based and outer island fisheries management. This proposed network has the potential to serve as the basis for a 24 h emergency radio network, if strengthened and enhanced to incorporate this capacity.

The recently prepared RMI Standard Disaster Mitigation Plan (SDMP), approved by both the RMI Government and by the US Federal Emergency Management Agency (FEMA), noted that the remoteness of island communities in the RMI, and the limited resources to deal effectively with a major disaster, exacerbates the vulnerability of the RMI and reinforces the need for effective risk reduction strategies such as zoning laws and building regulations to be developed and enforced (RMI Standard Disaster Mitigation Plan, 2005). Strengthening emergency communication and early warning systems is one of the ongoing mitigation measures identified in the SDMP. The SDMP notes that while there are communication and early warning systems in place in the RMI, they need to be more effectively maintained and end users of the systems need to be better trained in their application. The SDMP also identifies the need to provide basic information to all RMI citizens to help strengthen preparedness and community resilience through improved understanding of hazards and risks. The SDMP recognizes that the need should be addressed in a coordinated way that involves all sectors of society and calls for national and local disaster risk management training programs to support the improvement of national planning and disaster risk management practices.

**b. Goal and purpose:**

The overall goal of the project is to provide assistance for the implementation of specific areas of RMI's SDMP, and specifically those components related to the effective operation and maintenance of radio-based early warning systems and to the education and awareness of the population with regard to disaster preparedness and initial response.

Specifically, the assistance will serve to:

- (i) Design and implement ongoing participatory processes for identifying and addressing the needs related to effective operation and maintenance of radio-based early warning systems in the RMI and to the education and awareness of the RMI population with regard to disaster preparedness and initial response;
- (ii) Assess current and proposed communication and early warning systems, both technology and human-based with respect to their ability to deliver timely and clear disaster warnings to the majority of the population of the RMI;
- (ii) Within the framework of the SDMP and of relevant regional and international initiatives, and in conjunction with stakeholders including other potential donors, develop plans and proposals for strengthening the existing systems, including upgrading technology so that is capable of delivering timely and clear disaster warnings to the majority of the population of the RMI, on a 24 hour basis;
- (iii) Within the framework of the SDMP and of relevant regional and international initiatives, and in conjunction with stakeholders including other potential donors, develop plans and proposals for raising awareness and educating the population of the RMI so they have the ongoing knowledge, commitment and skills to undertake necessary disaster preparedness and initial response on the receipt of an early warning

- (iv) Implement, on a pilot basis, the proposed upgrading and improvements in technology and the proposed awareness raising and education programs in order to demonstrate the effectiveness of the plans and proposals;
- (v) Prepare a concept for ADB Loan as part of an updated CSPU for the RMI; and
- (vi) Provide guidance for the replication of lessons learned, success factors and guidelines in the form of further application to environmental project and program design in the Pacific region in support of the ADB's new Pacific Strategy, 2005 to 2009.

**c. Components and outputs:**

The proposed work will be carried out in the following sequence:

- (i) In the first instance, the entire fifteen month work program will be initially discussed in detail with all relevant, interested parties (Cabinet, Office of the President, relevant central Government departments including the Disaster Management Office (DMO), Outer Island Mayors and Councilors, Ministry of Transport and Communications (MTC), Chamber of Commerce, churches, land owners and land managers, women's groups, other NGOs, heads of relevant urban and rural communities) together with the Marshall Islands Council of NGOs (MICNO) and the Lead Disaster Management Specialist for the TA. The DMO, assisted by the Lead Disaster Management Specialist, will then prepare a revised work program for endorsement by the Minister in Assistance to the President, by Cabinet, and by ADB. The DMO will be considered the lead implementing agency for this activity. This proposed activity has already been discussed with relevant stakeholders;
- (ii) The TA team, comprising domestic and international specialists in coastal management and protection in the context of a small island developing state with strong traditional practices with respect to land tenure and use, will:
  - design and implement ongoing participatory processes for identifying and addressing the needs related to effective operation and maintenance of radio-based early warning systems in the RMI and to the education and awareness of the RMI population with regard to disaster preparedness and initial response;
  - using the same participatory consultative processes, identify, recommend and receive approval for the selection of at least one urban center, one sub-center and one remote Outer Island to be used as demonstration and assessment case studies in the TA;
  - assess current and proposed communication and early warning systems, both technology and human-based with respect to their ability to deliver timely and clear disaster warnings to the majority of the population of the RMI;
  - within the framework of the SDMP and of relevant regional and international initiatives, and in conjunction with stakeholders including other potential donors, develop plans and proposals for strengthening the existing systems, including upgrading technology so that is capable of delivering timely and clear disaster warnings to the majority of the population of the RMI, on a 24 hour basis;
  - within the framework of the SDMP and of relevant regional and international initiatives, and in conjunction with stakeholders including other potential donors, develop plans and proposals for raising awareness and educating the population of the RMI so they have the ongoing knowledge, commitment and skills to undertake necessary disaster preparedness and initial response on the receipt of an early warning;
  - implement, on a pilot basis, the proposed upgrading and improvements in technology and the proposed awareness raising and education programs in order to demonstrate the effectiveness of the plans and proposals;
  - prepare a concept for ADB Loan as part of an updated CSPU for the RMI, including a fully detailed plan of action for strengthening the existing communication and early warning systems, including upgrading technology so that is capable of delivering timely and clear disaster warnings to the majority of the population of the RMI, on a 24 hour basis, and equipping the population of the RMI so they have the ongoing knowledge, commitment and skills to undertake necessary disaster preparedness and initial response on the receipt of an early warning; and
  - provide guidance for the replication of best practices in the form of further application to environmental project and program design in the Pacific region in support of the ADB's new Pacific Strategy, 2005 to 2009.
- (iii) An appropriate RMI NGO will independently review, monitor and ultimately evaluate and report on the above work and outcomes;
- (iv) A representative group of key stakeholders will report on the project and outcomes to Cabinet, to relevant National and Local Government officials and to other relevant stakeholders; and
- (v) Depending on overall outcomes, a summary report will be published and presented to the region's leadership.

**d. Expected results and deliverables:**

The overall expected outcomes of the assistance include:

- plans and proposals for strengthening the existing communication and early warning systems, including upgrading technology so that is capable of delivering timely and clear disaster warnings to the majority of the population of the RMI, on a 24 hour basis;
- plans and proposals for raising awareness and educating the population of the RMI so they have the ongoing knowledge, commitment and skills to undertake necessary disaster preparedness and initial response on the receipt of an early warning;
- pilot studies that demonstrate and assess the effectiveness and efficiency of the proposed upgrading and improvements in technology and the proposed awareness raising and education programs in order to demonstrate the effectiveness of the plans and proposals;

- recommendations to National Government for strengthening the early warning system and for raising awareness and educating the population of the RMI so they have the ongoing knowledge, commitment and skills to undertake necessary disaster preparedness and initial response on the receipt of an early warning; and
- a concept for an ADB Loan that includes a fully detailed plan of action for strengthening the existing communication and early warning systems, including upgrading technology so that is capable of delivering timely and clear disaster warnings to the majority of the population of the RMI, on a 24 hour basis, and equipping the population of the RMI so they have the ongoing knowledge, commitment and skills to undertake necessary disaster preparedness and initial response on the receipt of an early warning.

**e. Social or environmental issues or concerns:**

The proposed TA aims to address specific needs identified in the RMI SDMP, specifically the current inadequacies in the communication and early warning systems in place in the RMI and the need to provide basic information to all RMI citizens to help strengthen preparedness and community resilience through improved understanding of hazards and risks.

**f. Plans for disseminating results/deliverables:**

The entire activity will be conducted in a highly participatory manner. Information on the impact of current status and trends will be disseminated to participants and stakeholders. An independent NGO will monitor, review, evaluate and report on the activity and its results. Participants will be encouraged to design their own solutions. Both written and verbal reports be presented by a representative group of the participants to Cabinet, to a meeting of senior National and Local Government officials, and as feedback to all stakeholders who participated in the project. Again, depending on outcomes, ADB will provide financing for improved layout and summary presentation for dissemination to all governments in the region. The pilot case studies could be presented to the ADB Annual Meeting of Pacific DMC Governors and to other regional fora as a model for enhancing disaster preparedness and this reducing vulnerability to natural and other disasters.

**7. Proposed executing/implementing agencies:**

The DMO will be the executing agency. The TA will be managed in Majuro, RMI by a staff member of the DMO, as designate by its Director, and assisted by the Lead Disaster Management Specialist. The TA will be managed in Manila by the proponent, Edy Brotoisworo, Senior Environment Specialist, assisted by the Lead Disaster Management Specialist in the RMI. Project costs include allowance for subproject monitoring, and reporting by an independent NGO based in Majuro. The Lead International Disaster Management Specialist, assisted by a Marshallese counterpart, will be responsible for coordinating and finalizing the detailed work program, for all project administration and for all progress reports.

**8. Nature/extent of government/beneficiary involvement in identifying or conceptualizing the assistance:**

All relevant agencies, both in the National and Local Governments, and outside of Government, have had an ongoing involvement in discussing and developing this proposal, including at a National Dialogue.

**9. Timetable for assistance design, processing, and implementation**

- a. Year included in CSP, CSP Update, SCSP, SCSP update, or interregional work plan: 2006
- b. Expected date of submission for approval
  - Lending:
  - Nonlending (project preparatory): May 2006
  - Nonlending (other than project preparatory):
- c. Period and duration of assistance
  - Lending:
  - Nonlending: November 2006 to February 2007

**10. Financing Plan**

- a. For lending
  - Ordinary capital resources: \$
  - Asian Development Fund: \$
  - Other: \$

If cofinancing is required, indicate amount and sources sought: \$ \_\_\_\_, from \_\_\_\_\_.

If known, provide cost estimates and financing arrangements.

Source	Amount (\$)
ADB Financing	
Government Financing	
Other Financing	

**Total Cost**

Source:

- b. For nonlending
- No resources required, other than ADB staff
  - ADB's administrative budget: \$
  - Grant TA funds
  - Other:

If cofinancing is required, indicate amount and sources sought: \$\_\_\_\_, from \_\_\_\_\_.  
If known, provide cost estimates and financing arrangements.

<b>Source</b>	<b>Amount (\$)</b>
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ADB Financing	
Government Financing	
Other Financing (IWP, SPREP, US Department of Education)	

**Total Cost**

Source: