

# Executive Summary

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As the 21<sup>st</sup> century begins, the Pacific Island people confront a future that will differ drastically from the past. Their physical climate, access to resources, ways of life, external relations and economic structures are undergoing simultaneous and interactive change. Pacific Island countries can actively engage in foreseeing and managing the process of adaptation to these changes, or they can have unplanned adaptation imposed on them by forces outside their control.

Managing these forces will be particularly critical in the area of climate change, a subject that is very difficult for communities and governments to grasp, but of immense and immediate impact on Pacific Island countries. Choosing a development path that decreases the islands' vulnerability to climate events and maintains the quality of the social and physical environment will not only be central to the future well being of the Pacific Island people, but will also be a key factor in the countries' ability to attract foreign investment in an increasingly competitive global economy.

This volume examines the possible impacts of changes in climate on high and low islands of the Pacific, and discusses key adaptation and financing strategies available to Pacific Island countries. The short-term outcome of the report is intended to be an improved understanding of the need and scope for adaptation policies in face of the challenges posed by climate change. Over the long term, it is hoped that the report can assist Pacific Island governments, businesses and communities to better adapt to change by building on the strengths unique to their countries and their people. It is also hoped that the findings of the report can contribute to the on-going international dialogue on adaptation financing.

This volume is divided into seven chapters. Chapter 1 outlines the nature of the challenges posed by climate change. Chapter 2 describes climate change scenarios for the Pacific Island

region. Chapter 3 examines the physical and economic impact of these scenarios on a high island of the Pacific – Viti Levu, in Fiji. The potential impacts of climate change on coastal areas, water resources, agriculture, and health are discussed in turn. Chapter 4 examines the potential effect of climate change on a group of low islands – the Tarawa atoll in Kiribati – focusing primarily on coastal and water resource impacts. Chapter 5 discusses the potential impact of climate change on the tuna fisheries of the Central and Western Pacific. Chapter 6 proposes a general adaptation strategy for Pacific Island countries. Key findings and recommendations are summarized on Chapter 7. Annex A describes the methodology and assumptions used to assess climate change impacts. Detailed background studies to this report are included in *References*.

This volume is the last of a four-volume report entitled “*Cities, Seas and Storms: Managing Change in Pacific Island Economies*” produced by the World Bank as the Year 2000 Regional Economic Report for the Pacific Islands. In addition to this specialized volume, the series includes a summary report (Volume I), a volume dedicated to the management of Pacific towns (Volume II), and a volume dedicated to the management of the ocean (Volume III).

## Impacts from Climate Change

The warming of the earth's atmosphere is likely to have substantial and widespread impacts on Pacific Island economies, affecting sectors as varied as health, coastal infrastructure, water resources, agriculture, forestry and fisheries.

Some policymakers dismiss the impacts of climate change as a problem of the future. But there is evidence that similar impacts are already being felt: the Pacific Islands are becoming increasingly vulnerable to extreme weather events as growing urbanization and squatter

settlements, degradation of coastal ecosystems, and rapidly developing infrastructure on coastal areas intensify the islands' natural exposure to climate events.

According to climate change models, the sea level may rise by 23–43 centimeters and the average temperature by 0.9<sup>0</sup>–1.3<sup>0</sup>C by 2050. Among the most substantial impacts of climate change would be losses of coastal infrastructure and land resulting from inundation, storm surge, and shoreline erosion. Climate change could also cause more intense cyclones and droughts, the failure of subsistence crops and coastal fisheries, losses in coral reefs, and the spread of malaria and dengue fever.

In the absence of adaptation, a high island such as Viti Levu could experience average annual economic losses (in 1998 dollars) of US\$23–\$52 million by 2050, equivalent to 2–4 percent of Fiji's GDP. A low group of islands such as the Tarawa atoll in Kiribati could face average annual damages of US\$8–\$16 million by 2050, as compared to a current GDP of US\$47 million. These costs could be considerably higher in years of extreme weather events such as cyclones, droughts and large storm surges.

How certain is climate change? A soon to be released review by the Intergovernmental Panel on Climate Change (IPCC) concludes that mankind has contributed substantially to observed warming over the last 50 years. While there is growing consensus that climate change is occurring, uncertainties remain on the timing and magnitude of the changes. Most studies, however, consider the Pacific Islands to be at high risk from climate change and sea level rise.

## **A Strategy for Adaptation**

How should Pacific Island countries adapt to climate change? One possibility is to do nothing, and by implication hope that climate change does not happen. This is the *de facto* present position of many governments, including those of several Pacific Island countries.

Another possibility might be to assume the worst and embark upon major investments in coastal protection – such as seawalls – and relocation of vulnerable infrastructure. The first approach is unwise in light of the increasing evidence of climate change. The second is impractical and unaffordable.

This report recommends that Pacific Island countries follow a strategy of precautionary adaptation. Since it is difficult to predict far in advance how climate change will affect a particular site, Pacific Island countries should avoid adaptation measures that could fail or have unanticipated social or economic consequences if climate change impacts turned out to be different than anticipated (IPCC 1998). As a first step, it is recommended that Pacific Islands countries adopt 'no regrets' adaptation measures that would be justified even in the absence of climate change. These include better management of natural resources—particularly of coastal habitats, land, and water—and measures such as disease vector control and improved spatial planning.

Acting now to reduce vulnerability to extreme weather events would go a long way toward preparing Pacific countries for the future, and reducing the magnitude of the damage. Taking early action may require adjustments of development paths and the sacrifice of some short-term economic gains. But it would vastly decrease the downsize costs should climate change scenarios materialize. The challenge will be to find an acceptable level of risk—an intermediate solution between a policy of inaction and investing in high cost solutions—and start adapting long before the expected impacts occur.

Under a 'no regrets' adaptation policy, Pacific Island governments would take adaptation goals into account in future expenditure planning, would support community-based adaptation, and would require major infrastructure investments to meet adaptation criteria. Adaptation would be viewed as a key feature in national policy in its own right, and would be taken into account in the development of policies in a wide range of sectors and activities.

The question of who will fund adaptation is a difficult and sensitive issue. Insofar as ‘no regrets’ measures help reduce the islands’ vulnerability to current climate events (independently of climate change) Pacific Island governments would be justified in funding adaptation from reallocations in public expenditures and development aid. Donors could support this process directly, or as part of natural resources and environmental management assistance.

The analysis of this report, however, clearly shows that the Pacific Islands are likely to experience significant incremental costs associated with climate change. It is urgent that the international community develop financing mechanisms to help countries in the receiving end of climate change to fund ‘no regrets’ adaptation. Countries that have taken early

action using their own resources should not be penalized with lower future allocations. These and other disincentives against ‘no regrets’ policies need to be urgently discussed in international forums. Of paramount importance, however, will be for the international community to move rapidly to develop a financing mechanism to assist countries such as the Pacific Islands in taking early adaptive action. The urgency of this action for small island states cannot be over-emphasized.

Although uncertainties remain, it now seems certain that climate change will affect many facets of Pacific Island people’s lives in ways that are only now beginning to be understood. As such, climate change must be considered one of the most important challenges of the twenty-first century and a priority for immediate action.

