Executive Summary

Background

The Pacific islands region faces increasing environmental and socioeconomic pressures exacerbated by global climate change and climate variability.[1] Adaptation to climate change and variability (CCV) is ultimately an issue of sustainable development. Even without climate change, Pacific island countries are already severely affected by climate variability and extremes, and they remain extremely vulnerable to future changes in the regional climate that could increase the risks. Countries in the Pacific have clearly recognized the need to (i) reduce their vulnerability to these increasing risks through adaptation, and (ii) strengthen their human and institutional capacities to assess, plan, and respond to these challenges.

Six case studies designed to assist countries to adapt to current and future climate risks have been prepared. The case studies were prepared through a regional technical assistance under the Renewable Energy, Energy Efficiency, and Climate Change (REACH) programme of the Asian Development Bank, and funded by the Canadian Cooperation Fund for Climate Change – Greenhouse Gas Abatement, Carbon Sequestration and Adaptation. The technical assistance was administered by the Asian Development Bank as the executing agency, and implemented in partnership with the Governments of the Federated States of Micronesia and of the Cook Islands (implementing agencies), Maunsell (NZ) Ltd (environmental and engineering consultancy) and the International Global Change Institute, University of Waikato, New Zealand.

The ultimate aim of the case studies is to show *why* and demonstrate *how* reducing climate-related risks is an integral part of sustainable development. The overall goal of a risk-based approach to climate change adaptation is to manage both the current and future risks associated with the full spectrum of atmospheric and oceanic hazards. Through a consultative process the following case studies were selected: (i) the Federated States of Micronesia - "climate proofing" a coastal community in Pohnpei; a roading infrastructure project in Kosrae; and the infrastructure, human health and environment components of the National Strategic Development Plan; (ii) the Cook Islands - "climate proofing" the design of the breakwater for the newly developed Western Basin, Rarotonga; a community inland from Avatiu Harbour; and the National Sustainable Development Strategy.

As part of the case studies, assessments were made of both the risks arising from current climate variability and extremes and from the future, incremental changes in those risks as a result of longer-term changes in climate extremes and variability. While the field studies and other activities to develop the six case studies were undertaken in Pacific Island Countries, the innovative methodologies and tools, as well as the findings, are applicable to all Small Island Developing States, and even to larger developing and developed countries.

Adaptation: Responding to Climate Change

The case studies highlight that adaptation takes place at three levels: i) project/community; ii) sector regulation and compliance; and iii) policy and planning level (short- and mid-term policy making and planning at sub-national level and national strategic development planning). Importantly, the case studies also demonstrate methods for prioritizing adaptation strategies and specific adaptation interventions, in terms of both their costs and benefits. A major goal, and challenge, was to determine, in a rigorous and quantitative manner, the incremental costs of adaptation to climate change.

For both the Cook Islands and the Federated States of Micronesia, climate risk profiles were prepared. Extreme climate events that are relatively

[1] Global climate change refers to a significant long-term change in the earth's climate system, whereas climate variability refers to short- to medium-term fluctuations in the climate system, and usually includes extreme weather events such as hurricanes, floods, droughts, and other related disasters caused by weather phenomena.

rare at present (likelihood in one year less than 0.05) are projected to become relatively common as a result of global warming (in many cases likelihoods are projected to increase to over 0.20 by 2050). Climate-related risks facing both the case study infrastructure projects and communities are already substantial, but in all cases are projected to increase dramatically as a result of increases in climate extremes and variability. For infrastructure projects it is possible to avoid most of the damage costs attributable to climate change, and to do this in a cost effective manner, if "climate proofing" is undertaken at the design stage of the project. Cost effectiveness can be further enhanced if environmental impact assessment procedures require that all development be "climate proofed". "Climate proofing" communities can also be cost effective if planning and regulatory measures take into account both current and future climate-related risks.

"Climate proofing" national strategic development plans enhances the enabling environment for adaptation and also establishes the requirement for "climate proofing" sector, sub-national (e.g., state, island and community) development plans as well as "climate proofing" individual development projects. In addition, it helps to ensure that actions to reduce climate-related risks are an integral part of, and harmonized with, sustainable development initiatives. Such "climate proofing" at the national policy level is one of the major ways to mainstream adaptation. In the case studies mainstreaming was facilitated further by preparing Adaptation Mainstreaming Guidelines for each of the two countries.

Lesson Learned and Demonstrated

Through preparation of the case studies, many key lessons were learned and demonstrated. Climate change will manifest largely as changes in the frequency and consequences of extreme events and inter-annual and similar variations, rather than as long-term trends in average conditions. While there are uncertainties in projections of greenhouse gas emissions, and of the response of the global climate as estimated by models, confidence in estimates of future changes in climate-related risks is increasing. This is due to the consistency in model-based projections of changes in the likelihood of extreme events and climate variability, as well as increased consistency between these projections and the observed changes in these likelihoods over recent decades.

At a practical level adaptation should focus on reducing both present and future risks related to climate variability and extremes. This is despite the fact that under present international climate change agreements funding is often limited to reducing future risks. In many instances current levels of climate risk are already high, due in large part to increases in risk over the past few decades. Moreover, adapting to current climate extremes and variability prevents precious financial and other resources being squandered on disaster recovery and rehabilitation and is an essential step to being able to withstand the pending changes in climate.

A risk-based approach to adaptation is not only desirable but also practicable. It combines both the likelihood and consequence components of climate-related impacts and can assess risks for both current and anticipated conditions, with the option of examining either specific events or an integration of those events over time. Furthermore, risk assessment and management are common to many sectors – e.g., health, financial, transport, agriculture, energy, and water resources. The existing familiarity of planners and decision makers with risk management therefore helps facilitate the mainstreaming of risk-based adaptation. Risk-based methods also facilitate an objective and more quantitative approach, including cost benefit analyses that result in evaluation of the incremental costs and benefits of adaptation and assist in prioritizing adaptation options. Many players are usually involved in the adaptation process. The risk-based approach provides a framework that facilitates coordination and cooperation amongst the various players, including the sharing of information that might otherwise be retained by information "gate keepers". It also links to sustainable development by identifying those risks to future generations that present generations would find unacceptable.

Most barriers to the successful application of a risk-based approach to adaptation relate to the existence of, and access to, information. While removing such barriers may be difficult, the experience gained in preparing the current case studies provides some grounds for optimism. Before generalized findings and lessons can be drawn from case studies of a risk-based approach to adaptation, many more examples will need to be developed. It is desirable to have internationally consistent assessment methodologies. International bodies, such as the Intergovernmental Panel on Climate Change, play major roles in establishing best practices. They would need to formally endorse and encourage a risk-based approach to adaptation before there will be widespread uptake. Currently, best practice favors the more traditional assessments of vulnerability, and of adaptation options. These have many limitations compared to a risk-based approach, including no formal assessment of the likelihood of future extreme events or variations in climate or of baseline conditions; a focus on individual events (e.g., an extreme rainstorm or a cyclone) or on a future date, rather than on an aggregation of the anticipated climatic conditions over a specified time period into the future; inability to differentiate between the costs of current climate extremes and variability and the future costs of those events plus any systematic trend (i.e., unable to evaluate the incremental costs of climate change); difficulty of incorporating economic, social and wider environmental scenarios into the assessment procedures; no functional link between the vulnerability and adaptation assessments; and no formal procedures for prioritizing adaptation options on the basis of cost and other measures of efficiency and effectiveness.

Until a risk-based approach to adaptation is formally endorsed and encouraged there will also be a lack of documentation and training opportunities. While a risk-based approach requires no greater skills and experience than are called on when using traditional assessment methods, there is a need to build a cadre of in-country expertise. So long as parallel frameworks and methodologies are being advocated, there will be confusion, and arguments for maintaining the status quo. Additional barriers include the need for formal specification of risk-based targets that define future levels of acceptable risk – this requires consultation with, and consensus amongst, key stakeholders, specification of relationships between magnitude and consequence of risk events of relevance, "rules" that specify future social, economic and wider environmental changes; and appropriate discount rates to be applied to future costs and benefits.

For the current case studies, all these barriers were overcome. Future efforts to develop additional case studies, as well as to support the practical application of adaptation measures, can build on both the methodologies and experience gained in preparing the current case studies. Thus the barriers are unlikely to be as imposing as for the initial work.

Implications for Governments and their Development Partners

Governments and other stakeholders are urged to note and act on the finding that the likelihoods of adverse weather and climate conditions are already high and are projected to increase in the future. Similarly, the consequences of these weather and climate events are also already very high, and will likely increase markedly as a result of climate change. Most climate-related risks can be reduced in a cost effective manner. Care should be exercised to ensure that future development does not exacerbate climate-related risks. Experience in both the Cook Islands and the Federated States of Micronesia highlights the importance of the enabling environment for successful adaptation, across all its many dimensions.

Governments and their development assistance partners should ensure that all proposed, new and upgraded development projects are "climate proofed" at the design stage. This should be part of good professional practice, with national and state climate risk profiles being used as the basis for "climate proofing" infrastructure, community and other development projects. Compliance with this requirement should be assessed as part of enhanced environmental impact assessment procedures. Governments should also undertake cost benefit analyses of all major development projects, including determining the incremental costs and benefits. If for a developing country the incremental costs are large, the Government should request developed country donors and other relevant agencies to fund the incremental costs. Governments should also ensure that all regulations (e.g., building code, public health regulations) are "climate proofed" as this will facilitate enforcement of policies and plans that should, themselves, be "climate proofed". These actions can be assisted by preparing and implementing National Guidelines for Mainstreaming Adaptation to Climate Change.

Climate change poses a threat to poverty reduction, water and energy supplies, waste management, wastewater treatment, food security, human health, natural resources and protection against natural hazards. Development also affects the rate and nature of climate change. These linkages between climate change and development are being increasingly recognized. The Asian Development Bank and other development partners need to modify their policies and procedures in ways that ensure that the design and funding implications associated with "climate proofing" infrastructure, community and other development projects are addressed early in the project cycle. Such initiatives mean that "climate proofing" will become an integral part of best practice, rather than a later add on. The Asian Development Bank and other development partners also need to establish and demonstrate such a standard of good practice, with the hope that others will follow. There is a requirement for further development of methods to identify, early in the project cycle, the incremental costs of this "climate proofing". For developing countries, these costs should be met from sources that do not add to their existing or future debt burdens. The Global Environment Facility (GEF) is one such source of funding for adaptation in developing countries.

Key Conclusions

The six case studies give rise to several important conclusions. It is possible to enhance the sustainability (e.g., lifetime) of projects at risk to climate change by "climate proofing" such projects at the design stage. This will normally require an investment that is small relative to the maintenance and repair costs that would otherwise be incurred over the lifetime of the project. Retroactive "climate proofing" is likely to be considerably more expensive than that undertaken at the design stage of a project. Many adaptation options qualify as "no regrets" adaptation initiatives, including being cost effective. Governments and their development partners should respond to these findings by ensuring that all projects are "climate proofed" at the design stage, making this part of good professional practice. Furthermore, governments of developing countries should determine the incremental costs and benefits of all major development projects and request that development partners fund at least the incremental costs. National and sub-national level regulations should be "climate proofed" as this will allow enforcement of policies and plans that should, themselves, be "climate proofed", in accordance with National Guidelines for Mainstreaming Adaptation to Climate Change.