



Lessons learned
PACIFIC ISLANDS: ADAPTING TO CLIMATE CHANGE

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Climate Change Discussion Paper

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Mainstreaming Climate Change Adaptation into the World Bank's Operational Work

Success Stories Lessons Learned

from the study

Pacific Islands: Adapting to Climate Change

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Summary and Recommendations

This document is intended as a resource to be used when familiarizing staff of the World Bank about the evolving climate change agenda, covering the issues of science, impacts, vulnerability and adaptation, and more broadly the policy agenda. It is based on a targeted analysis of a study, *Pacific Islands: Adapting to Climate Change*, recently undertaken by the Bank.

There is general agreement that Pacific Island people, ecosystems and economies are amongst those most vulnerable to extreme events and climate variability, and existing risks will be heightened by climate change. But the specific consequences of climate change are highly uncertain and the economic consequences largely unknown, as are the possible costs of adaptation. Two detailed case studies were undertaken in order to determine the integrated economic and non-monetary costs of the collective impacts of climate change. The resulting information provided a sound basis for demonstrating the extent and specific nature of the adaptation policies and measures required if Pacific Island Countries are to choose a development path that decreases their vulnerability to climate change while also maintaining or enhancing the quality of the human and physical environment, and safeguarding the future well being of the people and the life supporting systems on which they depend.

In order to reach its conclusions the study had to resolve a number of key methodological issues, including:

- inability to predict how the climate, the economy and society will change over the time horizons of interest, forcing reliance on scenarios;
- large uncertainties, which increase rapidly as the size of the study area decreases, as the time horizon increases and as the study tends to focus on more specific aspects of the economy, society and the environment;
- how to best reflect:
 - even the most significant of the many interactions between and within environmental, economic and social systems;
 - the present day value of the costs and benefits of future actions;
- reliance on “expert judgement” in the absence of robust models that simulate the pressures, impacts and human responses related to climate change;
- how to incorporate the costs of infrequent episodic events in annual averages of costs;
- extrapolating the findings derived from site-specific and island-scale case studies;
- determining the likely economic and non-monetary costs of climate change, including quantifying the incremental costs;
- effective involvement of the multiplicity of national, regional and international players in a complex, interdisciplinary study;
- ensuring effective communication of the study’s findings, and their successful uptake by the target groups; and
- ensuring key stakeholders retain ownership of the study.

Key findings of the study included the following:

- Pacific Island Countries are already experiencing severe economic impacts from climate and related events;
- these economic costs are spread relatively uniformly across all of the sectors studied;
- some effects of climate changes, even in the near-term, may be irreversible;
- while uncertainties in impact estimates and the success of adaptation measures are large, the need for timely implementation of adaptation measures is clear;
- climate change impacts are inherently distributed inequitably, preferentially affecting the poor and other vulnerable groups; and
- studies of the economic consequences of climate change have more impact on, and utility for, policy- and decision-makers responsible for national development planning and fiscal management than on those who already have a reasonable understanding of the technical and policy dimensions of climate change.

The key messages to be reported are:

- climate change will increase the likelihood of extreme events, and hence disaster risk;
- even today, extreme events are a major impediment to sustainable development;
- sustainable development planning already addresses risks, including those associated with financial shocks, national security, human health, transport services and food, water and fuel supplies;
- development planning must reflect both recurrent historical risks and new risks, including those associated with climate change;
- effective risk management prevents precious resources being squandered on disaster recovery and rehabilitation;
- many risks and losses are manifest locally, but measures to alleviate them have important national and international dimensions; and
- there is urgent need for an integrated approach that exploits the synergies to be gained from harmonizing responses to extreme events, variability and long-term change.

The present analysis leads to the following recommendations, which are elaborated in the discussion of suggested follow-up activities presented towards the end of this report:

Recommendation 1: Strengthen the Methodology

Strengthen the analytical framework that is used to: i) characterise and cost the consequences of climate variability and change (including extreme events); ii) to undertake comparative assessments of relevant disaster risk management and adaptation options; and iii) to identify the most cost effective and sustainable adaptation and disaster risk management processes and measures.

Recommendation 2: Enhance Mainstreaming of Adaptation

For a selected country, or selected countries:

- *use a participatory approach to identify, research and communicate the actions that will enhance policy and decision making in ways that will ensure maximum uptake and timely responses to the key messages arising from in the Bank's study (see p. 2);*
- *identify, and support at appropriate times in the national development planning cycle, the key change agents who can, by implementing the above actions, facilitate the mainstreaming of climate change adaptation and disaster risk management in the selected country(ies); and*
- *document and disseminate the success stories, lessons learned and good practice guidelines arising from the above activities.*

Recommendation 3: Promote Changes in Thinking and Policy Regarding Adaptation

Facilitate further studies, and implement national, regional and international outreach, education and professional development initiatives that will foster major shifts in thinking and policy related to the categories of adaptation projects eligible for funding, including developing and pursuing policies and procedures that will ensure that equitable levels of financial and other assistance are available for no regrets adaptation projects.

Recommendation 4: Develop, Document and Disseminate a Decision Support Tool

Build on the success stories and lessons learned in using the findings of a complex, technical study to enhance both institutional and human capacities to address climate change in a more cost effective and timely manner by, amongst other initiatives, developing and disseminating a decision support tool based on the methodologies developed and applied in the study, "Pacific Islands: Adapting to Climate Change".

Background

The World Bank's environment strategy – *Making Sustainable Commitments* – highlights the linkages between poverty alleviation and longer-term environmental sustainability. It explicitly recognizes the threats that degradation of the environment pose to poor countries and poor people in the long term. The strategy addressed three challenges – improving the quality of life; improving the quality of growth; and improving the quality of the regional and global commons. These three challenges make up the holistic approach the Bank is pursuing in order to link environment and development, on both the local and global levels. At the global level, the focus is on addressing the threat climate change poses to longer term development and for the poor to escape from poverty.

In order to manage this diverse and challenging agenda, including the increasing focus on cross-sectoral work, the Strategy gives priority, inter alia, to training of Bank staff. As a part of this broader training agenda, the Climate Change Team, in collaboration with the World Bank Institute, is commissioning the preparation of training material for a one day course on *Mainstreaming Climate Change Adaptation into the Bank's Operational Work*. The purpose of the course is to familiarize Bank staff about the evolving climate change agenda, covering the issues of science, impacts, vulnerability and adaptation, and more broadly the policy agenda. The course will draw on, among other things, the work that has been carried within the Bank, including the study *Pacific Islands: Adapting to Climate Change*.

Focus of this Report

With reference to the study, *Pacific Islands: Adapting to Climate Change*, this report provides material of relevance to the above-mentioned one day training course, by focussing on success stories arising from or identified in the study, along with lessons now, or still to be learned.

The formal terms of reference for preparation of the present report are provided in Annex 1.

Why was the Study Initiated?

The climate for development investment and assistance in Pacific Island Countries (PICs) is changing. Needs are increasing, at both national and community levels, as a consequence of internal drivers and external forces. For example, rapidly growing and urbanising populations are placing increased demands on declining natural resources and on the limited and ailing infrastructure. But competition for funds and other enabling resources are also increasing. Globalization means, in part, declining influence over trade and investment decisions and increased pressure to be internationally competitive. Uncertainty is pervasive, and is often used to justify procrastination or the failed outcomes of decision making. Risk profiles, whether they relate to the economy, the natural environment or socio-political systems, look increasingly ominous.

No where are these challenges better exemplified than with reference to the significance of climate change to PICs. There is general agreement that Pacific Island people, ecosystems and economies are amongst those most vulnerable to extreme events and climate variability, and that existing risks will be heightened by climate change. But the specific consequences of climate change are highly uncertain, to the extent that some specialists and many lay people in the region doubt the credibility of the international science-based consensus that global warming is a reality and its consequences profound.

Awareness of the need to adapt to climate change has occurred at the same time as globalisation causes PICs to have less control over their own destiny. Moreover, in-country capacity to incorporate adaptation into development planning and projects is declining, largely as a consequence of other sectors competing for both resources and the attention of decision makers. As recently as the Thirty-Second Pacific Islands Forum, Leaders recognised and endorsed the deep concern in the region about climate change and the need to seek

international understanding of the unique circumstances of Pacific Island Countries, especially low lying islands.

In keeping with its Environment Strategy, the Bank responded to these needs and circumstances by generating new information and understanding through two detailed case studies undertaken to determine the integrated economic and non-monetary costs of the collective impacts of climate change. This provided a sound basis for demonstrating the extent and specific nature of the adaptation policies and measures required if PICs are to choose a development path that decreases their vulnerability to climate change. This should be done while also maintaining or enhancing the quality of the human and physical environment, in order to safeguard the future well being of the people and the life supporting systems on which they depend, as well as ensuring the continued ability to attract foreign investment in an increasingly competitive global economy.

What Did the Study Set Out to Achieve?

Pacific Island Countries, like all others, face a dilemma – to focus on the uncertainties and hope that climate change does not happen; to accept the worst case scenarios and embark upon major adaptation programmes involving accommodation, protection and retreat, with the latter including emigration; or to take an intermediate approach between these extremes by defining an acceptable level of risk and implementing adaptation measures that mitigate those risks deemed to be unacceptable.

The study sought to inform those making this choice, by quantifying the likely economic cost of doing nothing, by highlighting the exorbitant costs of protecting land, ecosystems, people and infrastructure under worst case scenarios, and by identifying the co-benefits and cost effectiveness of a proactive, “no regrets” approach to adaptation that favours only those measures for which benefits exceed costs, even in the absence of climate change.

Other objectives of the study were to:

- assist Pacific Island governments, businesses and communities to adapt to climate change in ways which build on, and are compatible with, the social and cultural values and practices that underpin the traditional way of life in the Pacific Islands Region; and
- inform the on-going international dialogue on adaptation financing by highlighting the disincentives to implement no regrets adaptation measures, where incremental costs will by definition be zero; the current preference of donors and other funding bodies is to meet only the incremental costs of adaptation, thus favouring structural and similar solutions.

How Were Methodological Issues Addressed in the Study?

The approach taken in the study was pioneering for the Pacific Islands Region, and innovative from an international perspective. Thus it is appropriate to take some time to consider the success stories and lessons now, or still to be learned.

The following key methodological issues are among those that face any study which seeks to quantify the potential impacts of climate change at national and sub-national levels, and identify preferred adaptation strategies and options:

- inability to predict how the climate, the economy and society will change over the time horizons of interest, forcing reliance on scenarios;
- large uncertainties, which increase rapidly as the size of the study area decreases, as the time horizon increases and as the study tends to focus on the more specific aspects of the economy, society and the environment;
- how to best reflect:
 - even the most significant of the many interactions between and within environmental, economic and social systems;

- the present day value of the costs and benefits of future actions;
- reliance on “expert judgement” in the absence of robust models that simulate the pressures, impacts and human responses related to climate change;
- how to incorporate the costs of infrequent episodic events in annual averages of costs;
- extrapolating the findings derived from site-specific and island-scale case studies;
- determining the likely economic and non-monetary costs of climate change, including quantifying the incremental costs;
- effective involvement of the multiplicity of national, regional and international players in a complex, interdisciplinary study;
- ensuring effective communication of the study’s findings, and their successful uptake by the target groups; and
- ensuring the key stakeholders retain ownership of the study.

Presenting some of the more significant examples of success stories and lessons learned, or yet to be learned, must suffice.

Reliance on scenarios

The study is appropriately upfront about the inability to make categorical predictions of the future state of the climate, the environment in general, the economy and society.

In the case of climate, existing modelling capabilities facilitated preparation of temperature and precipitation scenarios, based on “best guess” and “worst case” estimates of global greenhouse gas emissions. By downscaling the results of several general circulation models (GCMs) it was possible to retain some semblance of “best guess” and “worst case” estimates for temperature and precipitation at the small island scale. For example, the implied “best guess” rainfall estimates are generated by the only GCM to have been validated for the South Pacific region. That model suggests precipitation will *increase* with global warming, a finding consistent with two of the other three models used in the analysis. The fourth model suggests precipitation will *decrease* in the study areas. Given that droughts are a significant hazard for PICs, this model was used to generate implied “worst case” estimates of change in precipitation.

Global mean projections of sea-level rise were used in the study, this approach being rationalized on the basis that confidence in GCM-based projections of sea-level at the regional level remains low and that there is limited availability of long-term historical data at country level. Since the study was completed Shea et al. (2000) and Hay et al. (2002) have presented both regionally- and nationally-relevant projections of sea-level. These developments alone highlight the rapid progress being made in climate change science and the consequent need, for this and other reasons, for frequent updating of both impact estimates and adaptation policies and practices.

Climate variability (including extremes), especially that associated with the El Niño-Southern Oscillation (ENSO), has widespread impacts on Pacific Island economies and societies. GCMs do not yet account for ENSO variability or for changes in the frequency and magnitude of extreme events. However, recent regional studies have provided important insights that were incorporated into the Bank’s study, including projections that cyclone intensities will increase over time, while average conditions in the future will increasingly resemble present-day El Niño conditions.

It is not possible to predict future socio-economic conditions at the time scales of relevance. Rather than using scenarios, economic costs were estimated based on the likely impacts under 2050 scenarios *as applied to 1998 conditions*. It is acknowledged that this approach will lead to conservative estimates of costs. An exception to this approach occurred for health impacts, where population projections to 2050 were used.

Large Uncertainties

The intrinsic unpredictability of complex systems, such as the economy, environment and human society, means there are large uncertainties in estimating their responses to external pressures such as climate change. Other sources of uncertainty include the downscaling of global, regional and national estimates of relevant variables to island and site scales, extrapolation and adjustment of point and areal data (including cost estimates derived from studies made outside the region). The characteristics of the uncertainties associated with the present study, and the methods that ensure they are reflected in cost estimates and policy advice, are described in sufficient detail to give confidence in the ensuing findings and facilitate replication of the results, application to other studies, and updating of the findings as more information comes to hand. The latter may well increase certainty in the estimates.

It is important to note, though this is not always made explicit at all relevant places in the study's reports, that the ranges in cost estimates are based on "best guess" and "worst case" scenarios"; i.e. the range does not include a lower cost limit of "best case". Since only incremental costs are assessed in the study, it could be argued that "best case" costs are always zero. However, "worst case scenarios" cannot be equated with cost estimates that can *never* be exceeded. Similarly, "best case" cost estimates would seldom, if ever, be zero.

The preceding discussion leads to another lesson of experience. Most members of the target group for the study will assume that the "best guess" costs are more likely to be incurred, relative to, say, the "worst case" costs. In reality, the distribution of probabilities within and beyond the "judged" range of certainty is undefined, and there is thus little basis for labelling a specific scenario as "best guess" or "worst case". Moreover, and of particular relevance to the Bank's study, since most causal chains include several different processes, the aggregation of conditional probabilities may well result in a composite probability distribution that has very different characteristics to the individual distributions that make up the links of the chain of causality. Significantly, in a recent risk assessment for climate change in the South Pacific, uniform probabilities were assumed across the ranges of CO₂ and sea-level rise scenarios adopted in the study.

Integrated Assessment

Policy makers require a coherent synthesis of all aspects of climate change, covering the spectrum of relevant pressure-effect-response interactions. Integration is thus across and within environmental, economic and social systems, including sectors and encompassing impacts, vulnerability and adaptation. In a fully integrated assessment mitigation will also be included.

Integration involves giving due attention to the interactions within and between all individual and collective components (e.g. household water consumption, water resources sector) of the aggregated systems, across the full cycle of technical assessment, policy, planning, and implementation. This is achieved, within practicable limits, by linking sector-, activity- and impact-focussed models in ways that explicitly or implicitly simulate the interactions among and between the pressure-effect-response chains and by using a common metric for expressing and assessing the individual and aggregated costs and benefits of climate change, including specific management interventions such as adaptation.

In this regard the study had some notable methodological successes, and more are signalled by the lessons that were learned. For example, the aggregated (incremental) economic impacts of climate change for the capital islands of two PICS has been determined using a robust methodology. Average annual costs, as well as those for selected extreme events, are presented. Such information is critical to identifying, prioritising and pursuing pertinent adaptation measures. It is therefore disappointing that few, if any, links are made between the estimated costs of impacts on the one hand and, on the other, the adaptation guidelines and examples of adaptation measures presented later in the study. Both of the latter include cost-benefit criteria, but it is unclear how these relate to the estimated costs. For example, the

guidelines also advocate a “no regrets” approach to adaptation, in part because they “need not involve large investments of public resources”. Are these *incremental* financial investments? Should an assessment also quantify the economic benefits, incremental or otherwise, of the no regrets strategies, in order to provide the basis for a sound choice of adaptation measures?

The sectors covered in the impact assessment (agriculture, water resources, coastal areas, health and regional tuna fisheries) are examined separately, meaning that the many and often strong interactions between them (for example, increased use of water for domestic consumption may reduce water availability for agriculture, be it subsistence or commercial) are not considered. The same sectors are characterized by internal interactions, but not one of the diagrams presented in the reports depicts any such feedbacks. The restricted number of sectors studied, and the partial level of integrated assessment achieved, impose significant limitations on the usefulness of the findings. This is an important but understandable shortcoming, which has been taken up in both the recommendations and the suggestions for follow-up activities.

Present Day Value of Future Actions

The outcomes of policy analyses that compare impact and adaptation (and mitigation) costs that occur at different points of time, are sensitive to the weight (the *discount rate*) afforded to events occurring in the more distant future. The discount rate is yet another source of uncertainty. Calculation of its effects is not, for this is a mathematically precise procedure.

Models suggest that the most severe impacts of climate change will occur further in time. However, the conventional, fixed discount rate approach causes the present day value of such future damages to be very small. Some analysts have suggested or used variable discounting rates that apply strong short-term discounting, but entail very little additional discounting for the longer term. This causes present generations to take serious notice of very large potential damages, even a century hence.

The Bank’s study circumvents a choice of discount rates by calculating damages and expressing indicative adaptation costs in 1998 \$US. Arguably, this approach to calculating adaptation costs is not as significant a shortcoming since the study also advocates immediate implementation of relevant adaptation measures.

An exception to the above methodology was made when estimating land and infrastructure losses. Estimates took into account the effects of depreciation and the way the population views present-day assets. A fixed discount rate of 10 per cent was used, with the attendant shortcomings described above.

Role of Expert Judgement

Virtually all decision analysis frameworks used in climate change studies require subjective judgements. Some authors have argued that, under such circumstances, attempts to provide quantitative estimates of impact costs and of adaptation benefits should be abandoned in favour of more qualitative approaches such as scenario planning and argumentation. Others, however, have argued that quantitative estimates are essential in environmental policy analyses that use formal and explicit methods. While science itself strives for “objective” empirical information to test theories or their derivatives (e.g. models), science for policy involves being responsive to policy makers’ needs for expert judgement at a particular time, given information currently available, even if those judgements involve a considerable degree of subjectivity (i.e. Bayesian analysis). Critically, subjectivity should be consistently and explicitly stated, for such well-established judgements, while highly subjective, are less likely to be confounded in policy debates or in media accounts.

The Bank’s study is exemplary in this regard, with the nature, use and implications of expert judgement always described in a clear and concise manner. Beneficially, in Volume IV of the

Report more pages are devoted to explicit descriptions and worked examples of the methodology, only some of which involves expert judgement, than to the findings themselves.

Accounting for Infrequent, Episodic Events

Extreme and other episodic natural events are of great significance, and all too frequent, for the Pacific Island economies and societies, as well as for the natural environment. But typically the economic costs of climate change (including changes in the frequency and intensity of extreme events in the regional climate system) are expressed as annual averages, thereby dampening the actual short-term costs of extreme weather and other sporadic events.

The study makes an important contribution by presenting not only annual average damages, but also the likely costs of relevant extreme events. Considerable effort is invested in characterizing changes in the frequency and magnitude of extreme events as a consequence of global warming, and following through to quantify the consequential economic losses.

Extrapolating the Findings of Site Specific and Island-Scale Case Studies

The intent of the study was to assist Pacific Island Governments, businesses and communities to better adapt to climate change. For obvious practical reasons the detailed analyses were geographically limited, to Viti Levu (Fiji), representative of a high island of the Pacific, to Tarawa atoll (Kiribati), representative of group of low islands, and to tuna fisheries in the Central and Western Pacific. Within this broader framework, specific analyses (such as assessing coastal impacts) were undertaken at case study sites selected to represent the broad biophysical and socio-economic conditions found in the islands. For Viti Levu, site specific findings were extrapolated to the whole island using length of coastline sampled relative to the total length of coastline with characteristics represented by the given study site. For Tarawa extrapolation was based on the land area represented by each study site.

Island-wide estimates of agricultural production and human health epidemic potential necessitated extrapolating point measurements of temperature and precipitation to the entire land area. Well established spatial extrapolation methods are an integral part of the PACCLIM model that was used for this and similar purposes.

All specific extrapolation methods are adequately described. However, the inference that findings based on a single high island, and a single atoll, have meaning for all PICS could, and should, be debated.

Estimating Likely Economic and Non-monetary Costs

The study advocates that, as a first step, Pacific Island Governments should assess the opportunities to realign public expenditure in order to support rapid implementation of a “no regrets” policy aimed at decreasing vulnerability to extreme atmospheric and marine events, and how partners such as those from communities and the private sector, could help defray the costs.

The recommended second step is for Pacific Island Governments and donors to investigate how to reallocate or attract new development aid to fund “no regrets” activities that cannot be adequately funded by public expenditures.

Implementation of both steps will be impeded, if not precluded, by the absence of defensible cost-benefit findings, and of estimates of the incremental and total costs of the proposed adaptation measures.

Cost and valuation exercises work best when competitive markets exist. Even when markets are distorted, they provide some useful information. But many impacts of climate change involve modifications in the direct and/or indirect flows of valued services to society. These services can

offer a wide range of valuable attributes, but they frequently go unpriced in the economic sense. Markets simply do not exist for some attributes and some services. In the Pacific Islands Region this is arguably the norm rather than the exception. To overcome this problem, researchers have extended the scope of the economic paradigm so that implicit and explicit tradeoffs between development and conservation of unpriced resources can be explored within the structures of standard decision support tools such as cost-benefit analysis. It is assumed that individuals are able to value changes in non-market goods and services.

The full spectrum of market and non-market goods and services results in there being many ways in which the costs of climate change might be captured. These include monetary losses, loss of life, changes in quality of life (including the need to migrate, conflict over resources, cultural diversity and loss of cultural heritage sites), species or biodiversity loss and distributional equity. There are no objective quantitative methods by which the costs expressed using one metric can be translated into those expressed using another. Research suggests natural scientists consider mainstream economists not only underestimate the severity of non-market impacts, but also that the implications of those impacts are not reflected within the monetised economy.

The Bank's study applies state of the art cost and valuation methods in order to provide defensible estimates of the economic costs of climate change for five key sectors that are important to most Pacific Island Countries. For the agriculture sector comparatively little difficulty was experienced in estimating the costs, due to the relatively ready availability of the necessary production and other data, and the existence of a market.

Care was taken to convert all prices to those for the 1998 baseline, using consumer price and other indices. As noted above, land and infrastructure loss estimates took into account the effects of depreciation and the way the population views present-day assets. In this case only a discount rate (of 10 per cent) was used, with the attendant shortcomings also described above.

However, in other instances many difficulties, most not normally encountered in undertaking similar studies for more developed countries, had to be overcome. Lateral thinking and persistence were often required!

Following are examples of the additional steps required to undertake a more conventional economic analysis:

- using information from Government agencies in Kiribati to estimate land prices since most land is not freely traded, and making adjustments for the differential price of freehold and customary (lease only) land in Fiji;
- estimating the economic cost (\$/hectare/year) to subsistence fishing through loss of mangroves due to sea-level rise, by using the known annual weight (tons) of subsistence fisheries in Fiji adjusted by the average value of artisanal fisheries (\$/kg), the portion of coastal fisheries production attributable to mangrove habitat (%), the portion of Fiji's mangrove fisheries occurring in Viti Levu (%) and the area of mangrove in Viti Levu (hectares);
- use of expert judgement to derive an estimate that 25% of the value of a road will be lost as a result of inundation;
- assuming that deterioration in the health of Viti Levu's coral reefs will lead to a 15 per cent reduction in tourism, based on the findings of studies in Palau and East Africa; and
- extrapolating the average amount an individual in the United States is willing to pay to avoid an illness (\$US50 per day) to the Fijian context, by attempting to take into account differentials in per capita income, and how disease is perceived and valued in the local culture.

In many instances the need and opportunities for refining the estimation methods are noted. In all cases the indicated costs should be considered as first estimates, at best. This is a rich ground for research and for demonstrating the value of science for policy.

Involving Diverse Players in a Complex, Interdisciplinary Study

Providing relevant policy-oriented advice and practical suggestions on actions to be taken by government, the private sector and communities is always a challenging task. The more so when the theme is managing climate change in Pacific Island economies.

How were these challenges met in the Bank's study?

First and foremost it was recognised that the study must be needs driven, reflecting the desire of Pacific Island Countries for credible guidance as how best to address climate change issues that threaten their very well-being. Country's were informed and engaged right from the inception of the study, and their needs were reflected in every decision made through the project cycle.

Secondly, and as important, it was acknowledged that in order to make a substantive incremental contribution to knowledge, understanding and implementation of appropriate actions, additional applied research was required. Moreover, existing information, methodologies and tools had to be recast in order for them to be responsive to the specific needs and circumstances of the study. It is reasonable to argue that without recognition of, and commitment to, the prerequisite to invest heavily in the foundations of the study, the outcomes would have been in the "more of the same" category – the recycling of information rather than the advancement of understanding.

In the Pacific Islands Region there is little endogenous capacity, willingness and ability to invest in studies that underpin sound policy advice. For too long efforts to address such shortcomings have been thwarted by an across-the-board aversion to fund what is perceived as research. The region, and the world, are the poorer for this omission.

The credibility and significant contributions of the Bank's study rest on the foundations provided by the background investigations. As shown later in this report, the background studies are already generating follow-up and spinoffs, including inspiring additional studies, replication in other economies both within and outside the region and, hopefully, further research-based investigations of relevant processes and procedures.

A third and related strategy adopted in the study was to define and pursue a clear set of objectives, and the strategies and methods by which these would be met. Of necessity this involved adopting a consultative approach encompassing national, regional and international stakeholder and key players. Significantly, when the challenge is large it is all too easy for efforts to be diverted and diluted, and objectives never fulfilled. Neither happened in this instance, because of effective project management that involved an ongoing, adaptive process of consultation, reflection and reinforcement of the study's core objectives and methods.

Fourthly, effective coverage of both the breadth and depth of the assessment, and ensuring sound policy guidance, necessitated a multidisciplinary problem-solving approach and study team. The latter had to include not only sector- and technique-based specialists, but also those with in-country experience, understanding and networks that allowed them to access diverse and often elusive information.

Many other factors contributed to the success of the study, overcoming the enormity of the challenge. However, those described above serve to highlight the need to be sensitive, committed and innovative if ambitious goals are to be met.

Effective Communication and Uptake of the Findings

The results of many studies languish on the bookshelves of information gatekeepers, and never benefit those for whom the studies were designed. Perhaps the comment is superfluous, but its veracity, especially in the Pacific Islands Region, belies the possibility of overstating the obvious.

The very title of the overall study, *Cities, Seas and Storms: Managing Change in Pacific Island Economies*, is an appropriate step to ensuring effective communication of the study's key findings and recommendations. So too was the decision to have a hierarchy of background reports, issue reports and a synthesis (*Summary*) report. The latter series of four reports is presented in accessible content, language and format, with the issue report *Adapting to Climate Change* restricting the more technical content to an annex, thereby allowing the main body of the report to focus on themes and commentary that will have immediate appeal and resonance with the target audience.

But appealing style and relevant content do not ensure successful uptake. *I can provide her with water, but I can't make her drink!* The Bank's study recognises this by also providing incentives and mechanisms for effective uptake. The former go to the very heart of the study's objectives – to quantify the real and credible costs of inaction in a changing climate; and to quantify the costs of actions that would mitigate the foregoing losses. Regrettably the study does not undertake the explicit linking of costs and benefits. Realistically, innovation can only proceed so far in any given step.

The study also advocates mechanisms that will enhance the chance of effective uptake. These are described under the headings of mainstreaming adaptation, building partnerships and funding adaptation. The strategies provided are relevant in theory. Their effectiveness in practice now needs to be demonstrated, as do the specific adaptation measures that have also been proposed.

Retention of Ownership by Key Stakeholders

Throughout the study the Bank played enabling and facilitation roles and never took direct ownership of the project. This was left to the participating countries, represented by appropriate technical and policy experts. Such an approach reflects two important considerations: a) national concerns related to external experts having unfettered access to sensitive economic and other information; and b) the reasonable belief that ownership of the study itself favours the subsequent effective uptake of its findings.

How Did the Study Process Facilitate Achievement of the Desired Outcomes?

At one level success was facilitated by identifying and implementing appropriate methods across the board, from project design and management, through researching and filling key knowledge gaps, to providing incentives and mechanisms for uptake of the study's recommendations. An overview of these methods, and the success stories and lessons now or still to be learned, is provided in the preceding section.

At a higher level, the study sought to provide guidance to Governments, the private sector and communities, to help them identify and achieve an appropriate level of risk attributable to climate change, avoiding the high costs of over-reacting, of misdirected effort and, perhaps sooner rather than later, of inaction. Cost-benefit analysis is one of several tools in the toolbox designed to equip policy makers and planners with the information and other resources required to make such judgements, leading to the efficient allocation of limited financial, human, institutional and other resources.

Because tradeoffs are required, decision makers need to be given comprehensive information covering all relevant components of the economy. Thus, while founded in sector- and issue-based analyses, the cost-benefit information needs to be aggregated so users have a comprehensive overview, as well as the critical detail. The Bank's study meets these requirements to a large extent. As noted above, there is a need for a more explicit integration of the costs and benefits so priorities and tradeoffs can be more readily identified.

As also mentioned above, the study process should ensure integration takes place at an additional level; that is, identifying and characterising cross-sectoral linkages and subsequently determining the nature and consequences of indirect impacts, as well as the extent to which adaptation measures focussed on one sector can accrue benefits and costs to other sectors. This is no small task, and regrettably little progress was made in this respect.

As noted above, the sectors covered in the impact assessment are examined separately, meaning that the many and often strong interactions between them are not considered. A strategy to progress this might have been to look at the costs of climate change to the tourism sector. As a “composite” sector it would “force” explicit consideration of interactions due to, for example, competition for water resources, and risks to human health, food security and coastal and transport infrastructure.

What were the Key Findings of the Study, and their Major Implications?

The key findings of the study, and their implications for a PIC’s broader development agenda, are as follows.

PICs are Already Experiencing Severe Impacts from Climate and Related Events

There is very high confidence¹ in this finding, which provides the main basis for subsequent recommendations that “no regrets” adaptation measures be pursued and that countries should initiate such adaptation measures as soon as practicable, perhaps by realigning public expenditure to support their rapid implementation, while also seeking “buy in” at local level and by the international community.

For example, Cyclones Ofa and Val, which hit Samoa in 1990-91, caused losses of \$US 440 million. This is in excess of the country’s gross domestic product for the two years combined. Northern Vanuatu was affected by two severe tropical cyclones in 1972 (Wendy) and 1988 (Anne). Due to damage to coconut trees it took some seven years before copra production peaked again after Cyclone Wendy, but even after 15 years production never reached pre-cyclone heights due to some trees being totally destroyed in the first event.

The cost of a single extreme event, typically far outweighs both the annual average economic damages of climate change in the 2050s and in some cases the annual gross domestic product, as illustrated below:

Table 1
Economic Costs of an Extreme Event and Climate Change in the 2050s,
and Gross Domestic Product (GDP)

Expressed in 1998 \$US million

Source: World Bank (2000)

| | Event and Cost | Climate Change | GDP |
|--------------|------------------|----------------|-------|
| Tarawa atoll | Storm surge: 430 | 8 to 16 | 47 |
| Viti Levu | Cyclone: 40 | 23 to 52 | 2,452 |
| Viti levu | Drought: 70 | 23 to 52 | 2,452 |

Current trends suggest a continuing rise in the vulnerability of PICS to climate events, independently of, but likely to be exacerbated by, climate change.

¹ Confidence levels are based on the expert judgment of the author.

Economic Costs of Climate Change and Variability are Spread Relatively Uniformly Across all Sectors Studied

There is medium confidence in this finding, which likely contradicts popular perceptions and earlier technical assessments. Data presented in Table 4.5 of the *Summary Report* support the finding.

For this reason, climate change is not an issue that should occupy only one or two branches of government. Nor should government be the sole player. Climate change and variability are pervasive in Pacific Island economies. This is the basis of the recommendations calling for creation of an enabling policy and legal framework (including making adaptation an appropriate priority in national development planning and harmonising conflicting sectoral policies), strengthening institutions and supporting co-management approaches, especially those that facilitate community participation in planning and budgetary decisions and in assisting with implementing adaptation.

Some Effects of Climate Changes, even in the Near-term, may be Irreversible

There is medium confidence in this finding, which does not apply universally, but in specific instances. An example is provided for coral reefs which are extremely vulnerable to the combined effects of human activities leading to their degradation, and of climate variability (including extreme events) and change.

For Viti levu alone, the annual average economic costs arising from the loss of coral reefs and related services can be as high as \$US14 million. If there was no recovery in the longer term, the cumulative costs would be much higher, even when expressed as an annual average.

While falling far short of irreversible changes, even severe impacts may well preclude opportunities to act in the future, in part because rehabilitation costs may be prohibitive. Indeed, researchers have noted that, when the full range of possible driving forces is applied to impact models, the spectrum of possible impacts becomes too large for decision makers to identify practical applications of adaptation options.

Uncertainties in Impact Estimates and the Success of Adaptation Measures are Large but the Messages are Clear

In even the recent past the Precautionary Principle (*where there are threats of serious irreversible damage, lack of full scientific certainty should not be used as a reason for postponing precautionary measures to anticipate, prevent or minimize the causes of climate change and limit its adverse effects*) was often invoked to justify why action should be taken to address climate change issues. Uncertainties in impact estimates, and even more so in the likely success of adaptive responses, were simply too large to convince most policy makers to divert scarce resources from one part of the national, enterprise or community budget in order to support climate change related activities.

Over time some uncertainties have been addressed, and have thus reduced. The Bank's study is a beneficiary of these efforts. While the range given for most costs, referring to "best guess" and "worst case" estimates, is typically still large, the implications are clear – climate change is likely to impose major incremental social, environmental and economic costs on PICs.

Other Findings

The study identifies other findings but, relative to those listed above, it does not substantiate the conclusions reached, and neither does it explore their implications.

Such findings include the conclusion that climate change impacts are inherently distributed inequitably, preferentially affecting the poor and other vulnerable groups

Do the Study Findings Call for a Fundamental Change in the Policy Agenda?

The study's findings justify the call to mainstream both disaster reduction and adaptation to climate variability and change, in a mutually consistent and supportive manner. The key to this is to ensure both disaster risk management and adaptation are integral components of the national risk management strategy and, in turn, of the national development planning process. Most countries already have policies and plans to manage financial risks, human health risks, biosecurity risks, agricultural risks, risks in the transport sector and energy supply risks. Disasters and climate change and variability should be included and addressed in the portfolio of national risks.

This can best be achieved by having key players recognise that both disasters and climate change are significant impediments to successful economic development – i.e. they represent risks to regional, national and local economies. The study shows that countries are already experiencing the manifestations of these risks, in the form of recent disasters, but also via climate variability.

The most efficient and effective approach is to manage the risks in an integrated manner – through disaster risk management and planned and proactive adaptation that involves “no regrets” strategies. Many disaster and climate change response strategies are the same as those which contribute in a positive manner to sustainable development, sound environmental management, and wise resource use. They are also appropriate responses to climatic variability and other stresses on social, cultural, economic and environmental systems. Therefore, “no regrets” strategies, plans and actions are beneficial even in the absence of climate change. Risks associated with the full spectrum of hazards, from extreme events to the consequences of long-term climate change, should be managed in an holistic manner as an integral part of national development planning.

It is important that national development plans, and sectoral plans, include disaster reduction and climate change adaptation measures that will ensure risks are reduced to acceptable levels. These measures, and related strategies, will help strengthen decision making processes by requiring that specific programmes and projects include strategies and measures to manage risks associated with extreme events and with climate change and variability. Such mainstreaming can also be facilitated by undertaking institutional strengthening and reforms that result in Economic Ministries having a mandate and responsibility for ensuring that disaster reduction and climate change are reflected in national policies, plans and programmes.

The need for mainstreaming will be fulfilled when people are committed to approaches that create an “Environment for Development”, as opposed to adopting the bi-polar view of “Environment and Development”.

The study also highlights the impediments to pursuing no regrets adaptation as a result of the current preference and practice of donors and other funding bodies to meet only the incremental costs of adaptation, thus favouring structural and similar solutions. While predominantly a reflection of international policy, as well of the policies of some developed countries, the practice also distorts national adaptation and sustainable development policies in the Pacific Islands Region. The study advocates a major shift in thinking and policy regarding which categories adaptation projects are eligible for funding, while also ensuring that appropriate levels of assistance are available to no regrets type projects.

Has the Study Already had an Impact on Policy Makers?

Unofficial discussions with government officials from both Fiji and Kiribati, along with informal observations made at recent meetings and with respect to recently published reports, provide the basis for the following comments. They contain examples of success stories as well as lessons learned.

The informal observations are:

- The study's findings are relevant and practical, and have been used to brief ministers and other senior individuals in government and for input into state of the environment and other assessments;
- The study played an important role in enhancing capacity to manage climate change in both Fiji and Kiribati, both during and subsequent to the study itself;
- Climate change impacts become more "real" when dollar values are associated with them; climate change then becomes an economic issue as well as an environmental issue;
- Concerns are often raised as to whether the projections are realistic, especially those coming from models;
- Environment officials and politicians have not, by and large, changed their strategies, plans and actions as a result of being involved in the study itself, or due to its findings – these individuals (even at the most senior level) were already well versed in the climate change issue as a result of involvement in such activities as previous technical studies, conferences and workshops and international and regional negotiations;
- On the other hand, officials and politicians with responsibilities for national planning, finance and related matters now see the need to strengthen the capacity of their ministries and departments, as well as those of other relevant arms of government (including environment), in order to be better able to integrate adaptation to climate change into national planning;
- Such changes in attitude and intentions are in part due to the Bank's study, but the messages are being reinforced from other sources;
- National capacity to mainstream adaptation is currently restricted for various reasons, including political and institutional barriers, competition for resources, sensitivities over mandates and responsibilities and lack of familiarity with relevant methodologies and tools (e.g. those related to risk assessment and management);
- There are very real impediments to changing national plans mid-stream; the study's impacts on national planning may not become apparent until a new development plan is issued; this will reflect new information and understanding, including that arising from the Bank's study;
- Since the planning cycle is typically 5 years, there is a significant inertia related to making changes;
- Given the long planning cycle it is especially important to engage with countries when they are at critical stages of their planning cycle;
- Current national plans do acknowledge the importance of climate, but only at a general level, and with responsibilities limited largely to the environmental branch of Government;
- Emerging thinking re national plans is to follow a more comprehensive and integrated approach, with climate being reflected across all sectors;
- Information keepers are critical to ensuring relevant policy advice reaches the key decision makers; often they are the de facto decision makers; and
- Changes in government personnel, and in governments themselves, are also impediments to an effective evolution of planning for climate change; such changes exacerbate timing problems, meaning that improvements are delayed.

In addition, the following incomplete list of other applications of the study's methods and findings should be noted:

- building institutional and human resources capacities for assessing and managing the costs of climate change to the economies of Kiribati and Fiji;
- the estimates of damages reported in the study have been used by the Government of NZ to derive the indices of vulnerability recently published in *Climate Change Impacts on New Zealand*;
- the data and methods used in estimating the incidence of ciguatera in Kiribati have been used in a study of marine toxins;
- in technical- and policy-focussed assessments of the sensitivity of the Fijian economy to climate extremes and variability;
- presentation to, and discussions at the *UNDP Expert Group Meeting – Integrating Disaster Reduction and Adaptation to Climate Change*, held in Havana, Cuba, from 17-19 June, 2002;

- preparation and presentation of guidance material for the *High Level Seminar on Adaptation to Climate Change: Mobilising Funds and Mainstreaming* which met in Nadi, Fiji, from 14-16 May 2002;
- planning for a major adaptation project in Kiribati; and
- implications of climate variability and change for land management in Fiji.

Conclusion

The authoritative report of Working Group II of the Intergovernmental Panel of Climate Change (IPCC, 2000) states:

Working Group II has reviewed a huge volume of climate impact assessment studies conducted to date. Most of these studies investigate possible implications of climate change for a single economic sector or environmental component. An increasing, yet still small, fraction of these studies lists options to alleviate impacts, but few take even the next step of exploring direct and indirect costs of those adaptation options. Even fewer studies provide comprehensive assessments of direct and indirect benefits.

This is the benchmark against which the Bank's study can be compared, favourably.

Possible Follow-up Actions and Resulting Recommendations

The report *Pacific Islands: Adapting to Climate Change*, as well as the present analysis, have identified the desirability of undertaking further foundation studies in order to provide even more comprehensive and authoritative guidance on the need and opportunities for Pacific Island economies to adapt to climate variability and change, including extreme events, in a timely and cost effective manner.

Decision makers are always forced to make tradeoffs. To make informed, and hence quality decisions, it is desirable that they have access to comprehensive cost-benefit analyses covering all relevant components of the economy. While the required information may be derived from sector- and issue-based analyses, the cost-benefit information needs to be aggregated so users have a comprehensive overview, as well as the critical detail. The analytical framework used in the Bank's study should be expanded and strengthened by including a more explicit integration of the anticipated costs of climate-related events and the benefits of reducing risks to acceptable levels through a seamless combination of disaster risk management and adaptation.

This leads to:

Recommendation 1: Strengthen the Methodology

Strengthen the analytical framework that is used to: i) characterise and cost the consequences of climate variability and change (including extreme events); ii) to undertake comparative assessments of relevant disaster risk management and adaptation options; and iii) to identify the most cost effective and sustainable adaptation and disaster risk management processes and measures.

The study presents compelling evidence in support of the call for mainstreaming both disaster reduction and adaptation to climate variability and change. But it is unfortunately short on detail as to how this might best be achieved. It is well known that implementation of even the most desirable changes is impeded by a lack of a real life success story. The bank's study is a victim of this reality.

Mainstreaming can best be achieved by having key players recognise that both disasters and climate change are significant impediments to successful economic development – i.e. they represent risks to regional, national and local economies. The study shows that countries are

already experiencing the manifestations of these risks, in the form of recent disasters, but also via climate variability.

The key to mainstreaming is to ensure both disaster risk management and adaptation are integral components of the national risk management strategy and, in turn, of the national development planning process, with all systems operating in a mutually consistent and supportive manner. Disasters and climate change and variability should be included and addressed in the portfolio of national risks that include financial risks, human health risks, biosecurity risks, agricultural risks, risks in the transport sector and energy supply risks.

It is important that national development plans, and sectoral plans, include disaster risk management and climate change adaptation measures that will ensure risks are reduced to acceptable levels. These measures, and related strategies, will help strengthen decision making processes by requiring that specific programmes and projects include strategies and measures to manage risks associated with extreme events and with climate change and variability.

Mainstreaming can also be facilitated by undertaking institutional strengthening and reforms that result in Economic Ministries having a mandate and responsibility for ensuring that disaster reduction and climate change are reflected in national policies, plans and programmes.

This leads to:

Recommendation 2: Enhance Mainstreaming of Adaptation

For a selected country, or selected countries:

- *use a participatory approach to identify, research and communicate the actions that will enhance policy and decision making in ways that will ensure maximum uptake and timely responses to the key messages arising from in the Bank's study (see p. 2);*
- *identify, and support at appropriate times in the national development planning cycle, the key change agents who can, by implementing the above actions, facilitate the mainstreaming of climate change adaptation and disaster risk management in the selected country(ies); and*
- *document and disseminate the success stories, lessons learned and good practice guidelines arising from the above activities.*

The Bank's study documents the impediments to pursuing no regrets adaptation as a result of the current preference and practice of donors and other funding bodies to meet only the incremental costs of adaptation. This favours structural and similar solutions. While predominantly a reflection of international policy, as well of the policies of some developed countries, the practice also distorts national adaptation and sustainable development policies in the Pacific Islands Region. The Bank's study advocates a major shift in thinking and policy with respect to which categories adaptation projects are eligible for funding, while also ensuring that appropriate levels of assistance are available to no regrets type projects.

This leads to:

Recommendation 3: Promote Changes in Thinking and Policy Regarding Adaptation

Facilitate further studies, and implement national, regional and international outreach, education and professional development initiatives that will foster major shifts in thinking and policy related to the categories of adaptation projects eligible for funding, including developing and pursuing policies and procedures that will ensure that equitable levels of financial and other assistance are available for no regrets adaptation projects.

As noted in the preamble to Recommendation 1, decision makers are always forced to make tradeoffs. Reaching a compromise that is socially equitable, environmentally sound and economically justified means that decision makers must process large amounts of information.

Recommendation 1 calls for an expanded and strengthened analytical framework to support a fully integrated assessment of the costs of climate-related impacts and the benefits of disaster risk management and adaptation to climate variability and change. Such a framework, and the associated methodologies, could form the basis of a decision support tool that allows the complex issues to be explored in ways which will enhance the quality of the decision making process.

The foundation of the decision support tool would be a combination of a truly integrated assessment model and relevant national data that can document and characterise spatial and temporal patterns and interactions, for all relevant sectors and for the economy as a whole.

Such a tool would support rigorous and comprehensive cost-benefit analyses as well as allowing some or all of the following issues to be explored and resolved:

- characterising and quantifying the most significant interactions between and within environmental, economic and social systems;
- how will the climate, the economy and society change over the time horizons of interest?
- what is the impact of uncertainties, and how does the impact vary with the size of the study area, with the time horizon and with a focus on the more specific aspects of the economy, society and the environment?
- what are the present day values of the costs and benefits of future actions?
- how can “expert judgement” best be incorporated into the decision making process?
- how can the costs of infrequent episodic events best be reflected in annual averages of costs?
- how can the findings derived from site-specific and island-scale case studies be extrapolated in ways that provide optimal guidance to national decision makers? and
- quantifying the likely economic and non-monetary costs of extreme events and climate variability and change, including the “incremental costs”.

This leads to:

Recommendation 4: Develop, Document and Disseminate a Decision Support Tool

Build on the success stories and lessons learned in using the findings of a complex, technical study to enhance both institutional and human capacities to address climate change in a more cost effective and timely manner by, amongst other initiatives, developing and disseminating a decision support tool based on the methodologies developed and applied in the study, “Pacific Islands: Adapting to Climate Change”.

Examples of Discussion Topics, Activities and Questions for Trainees²

1. How and to what extent does the Bank’s study further implementation of the Bank’s environment strategy?
2. Are there additional methodological issues that have not been highlighted in this report? If so, what are they and how have they been addressed in the Bank’s study?
3. Are “best guess” and “worst case” scenarios an appropriate way to bracket uncertainty? Is there a common understanding of the implied ranges?
4. Does the Bank’s study make the continued use of the precautionary principle redundant?
5. Are costs associated with the “best case” scenario likely to be zero?

² Annex 2 provides guidance for working in groups.

6. Revise the diagrams showing within sector linkages so that internal feedbacks are represented.
7. Discuss the application of discount rate in assessing the economic costs of climate change.
8. Discuss the place of Bayesian analysis in climate change impact and adaptation assessments.
9. Are there even more useful ways of accounting for infrequent, episodic events that those used in the Bank's study?
10. Is the use of two case studies, one for Viti Levu and one for Tarawa atoll, adequate basis for demonstrating the economic costs of climate change for PICs?
11. How might non-monetary costs be better reflected in the assessment of the economic consequences of climate change for PICs?
12. Discuss the lessons you learned regarding project design and management when reading the present report.
13. Outline some additional strategies that would enhance communication and uptake of the findings of the Bank's study.
14. Critically examine the study's key findings and their implications for a PIC's broader development agenda.
15. Do you agree that the study findings justify a fundamental change in the policy agenda?
16. What are the lessons to be learned from the impact the Bank's study has already had on policy makers.
17. Do past and present costs of adaptation provide the best first-order estimate of future adaptation costs?

References

- Hay, J.E., Mimura, M., Campbell, J.R., Fifita, S., Kosky, K., McLean, R.F., Nakalevu, T., Nunn, P., and N. de Wet, in prep.: Climate and Sea-level Variability and Change in the Pacific Islands Region: A Resource Book for Policy and Decision Makers, Educators and other Stakeholders. South Pacific Environment Programme, Apia, Samoa.
- IPCC, 2001: Climate Change 2001. Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, 1032pp.
- Shea, E.L., Dolcemascolo, G., Barnston, A., Hamnett, M. and N. Lewis, 2001: Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change. Pacific Islands. US Global Research Program. East-West Center, Honolulu, Hawaii, 102pp.
- World Bank, 2000: Cities, Seas and Storms. Managing Change in Pacific Island Economies. Volume IV Adapting to Climate Change. World Bank, Washington, DC, USA, 73pp.

Annex 1

Terms of Reference

Scope of Work: Your scope of work is to prepare a 10 to 15 page document based on the *Pacific Islands: Adapting to Climate Change* study. The document should cover, but not be limited to the following:

- (a) Context of the Study, with the view to highlighting the importance of climate concerns for the country in general and specific sectors in particular.
- (b) The objectives of the study
- (c) Methodological issues addressed in the context of the study.
- (d) The process of the study, particularly the approach adopted for establishing the cross-sectoral linkages.
- (e) Key findings of the study and their implications for the Country's broader development agenda. In particular, do the findings of the study call for a fundamental change in the policy agenda or a simple realignment of policies. Illustrative examples would be helpful.
- (f) Impact, if any, on policy makers.
- (g) Lesson of experience.

Reporting Requirement and Outputs: You will work from your home base on the assignment, and will liaise with Sofia Bettencourt, Sr Natural Resource Economist, World Bank, and report to Ajay Mathur, Team Leader, Climate Change Team.

In terms of outputs, you will produce a first draft of the report by June 5, 2002 and the final report by June 25, 2002.

Annex 2

Guidance for Working in Groups

IMPORTANT ISSUES IN GROUPS

- *Leadership* -
 - provides direction and focus
 - effective leaders will empower others to participate and achieve
 - leaders need the consent of others to be effective
 - leadership can be formalised
- *Power* -
 - who has it?
 - what kinds of power are there in the group?
 - *personal*
 - *positional*
 - *factional*
 - *knowledge*
 - *can power be shared equitably; if not, why not?*
- *Dealing with conflict* -
 - must recognise and address conflict
 - implement strategies to prevent it
 - have available strategies to deal with it
- *Dealing with feelings* -
 - personal feelings can't be ignored
 - recognise the personal feelings of each individual in the group
- *Understanding personal styles* -
 - need knowledge of how people "work"
 - need to know their behavioural traits
 - need to know their body language
- *Developing trust* -
 - establishing relationships
 - some level of disclosure is important
 - give and take is important
 - learn to take some risks with the group

A HEALTHY GROUP NEEDS..

- A common *purpose*
- Some *organisation* in order to meet the group purpose
- Ground *rules*, a facilitator, coordinator, recorder, agreed process
- Ability to *grow and adapt*
- Ability to be *free from cliques and subgroups*
- Ability to *value the contribution* of those in the group, valuing differences and accepted group norms
- A capacity to *face discontent* and *resolve conflict* amongst members

SOME BEHAVIOURS THAT MAKE GROUPS NON-FUNCTIONAL

- Competing
- Apathy
- Cliques
- Blocking
- Dominance
- Recognition seeking
- Polarisation
- Withdrawing
- Personality clashes
- Aggression
- Gatekeeping
- Seeking sympathy
- Lack of trust
- Nondisclosure

WHAT YOU CAN DO TO AVOID BECOMING A TEAM.....

- Don't join in
- Have an idle chat
- Allow an individual to dominate
- Avoid any expression of feelings
- Refuse to set yourself any task or goal
- Don't find out about each other
- Don't disclose anything about yourself
- Express criticism and hostility towards others
- Don't listen to each other
- Show no interest in the team
- Don't keep to agreed procedures
- Don't clarify responsibilities
- Don't clarify or record what has been decided
- Don't check on progress or time

GROUND RULES

- some things to discuss

- How will decisions be made - consensus? majority?
- How will differences be resolved?
- How will progress be monitored?
- What does a member do when they can't meet a deadline?
- What happens when members don't pull their weight?
- What happens when someone breaks an agreement?
- What are the ground rules about punctuality, attendance?
- What values are important e.g. respect, fallibility, honesty, risk-taking, confidentiality, domination, non-contribution to discussions?
- How often will this agreement be reviewed?

ORGANISING, SCHEDULING & ASSIGNING TASKS

- use:

- Flow charts
- Gantt charts

ORGANISING, SCHEDULING & ASSIGNING TASKS

- Some critical factors are...
 - Identification of tasks
 - Deadlines
 - Equitable distribution of tasks
 - Utilization of strengths and interests
 - A record of who is responsible for which task

ADVICE ON WORKING IN TEAMS

- Have ground rules
- Pay attention to assessment criteria
- Allocate roles for group meetings
- Set clear goals and deadlines
- Divide the task up, allocating jobs according to the skills of group members
- Record decisions
- Work alone, in pairs, and as a group
- Develop strategies for group work: rounds, problem solving, brain storming
- Review progress and your goals
- Have a structure for self, peer and group assessment
- Leave time at the end for checking

REWARDS AND RITUALS

- Don't forget to give yourselves some rewards as you meet deadlines and complete tasks
- Maintaining group energy is important - individuals will work more cooperatively if there is plenty of positive feedback
- *Stay loose and laugh a lot!!!*