

# **DECIDING FOR THE FUTURE**

#### Using Cost Benefit Analysis to support climate risk management in the Pacific





The Pacific-Australia Climate Change Science and Adaptation Planning (PACCSAP) program is funded by the Australian Aid Program, managed by the Australian Government Department of the Environment and delivered in the Pacific in partnership with CSIRO and the Bureau of Meteorology. PACCSAP supports 14 Pacific Island Countries in managing their future climate risk through improving the climate science, increasing awareness of climate change, and improving adaptation planning in key development sectors.

While there is widespread concern about climate change across Pacific Island Countries, there are still significant gaps in understanding the likely timing, nature and extent of impacts and the types of effective adaptation actions available. Economic analysis of climate change impacts and adaptation options is particularly limited. PACCSAP has thus supported cost-benefit analysis (CBA) of adaptation options through the PACCSAP-CBA initiative, to assist central agencies and decision makers to make more informed development decisions given competing priorities and constrained resources.

The report provides a summary of the common experiences and lessons learnt from the PACCSAP-CBA project in Vanuatu and Solomon Islands. Technical information, detailed analysis and data sources can be found in the Technical Report produced by AECOM – *Cost-Benefit Analysis for Food Security in Solomon Islands and Road Improvement in Vanuatu* - available on request or online.

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Australian Government Department of the Environment



#### Why use Cost Benefit Analysis?

Traditionally, development policies and activities have been based on our understanding of the historical climate.

Continuing to develop and implement projects without recognising the implications of the changing climate can result in substantial economic and social costs.

To cost effectively respond to climate change and other development challenges, decision makers require robust information and clear processes to select the most appropriate adaptation options.

Cost Benefit Analysis (CBA) is an approach that can bring together a range of economic information sources to assess the merits of different adaptation options in an objective and reliable way to evaluate impacts on a community over time.

CBA is versatile because it can include both quantitative and qualitative information. For example, this information may include the knowledge and experiences of local communities, climate science and the costs of climate change.

Investigating a food security project in the Solomon Islands, and critical infrastructure in Vanuatu, this project has tested and refined the application of CBA for managing climate risks in the Pacific. The process has highlighted how CBA can be practically applied, some of the common challenges typically encountered and has provided some lessons to overcome these challenges.



#### How can CBA be used?

CBA is an analytical tool that can be used to assess and compare the costs and benefits associated with alternative adaptation interventions to enable the decision maker to select the option with the greatest benefit to the community. CBA involves identifying and quantifying loss and damage costs associated with climate change impacts under a 'business as usual' scenario, compared to the costs and benefits of taking a particular adaptation action.

CBA is particularly useful when considering development decisions for longer time horizons, or where multiple options require consideration. This makes it a useful tool for decisions to adapt to climate change. CBA can be used in the planning phase of a project (ex-ante CBA) to select the adaptation option most likely to generate the highest returns. CBA can also be used after an adaptation project has been implemented (ex-post CBA) by assessing the impact of the intervention for replication, advocacy and monitoring efforts.



Detailed CBA with quantitative information, analysis and calculations is typically used for large projects. For smaller projects or when data gaps are too significant, qualitative CBA allows the comparison of costs and benefits of activities based on narratives rather than detailed and monetised assessment.



# How is CBA incorporated into climate risk management?

Climate Risk Management (CRM) is an approach to help identify, analyse and evaluate climate risks and formulate a range of adaptation options to respond to the most threatening risks. CRM is an approach based on the internationally recognised risk management framework (ISO31000) which takes climate change into consideration.

CBA is most useful when mainstreamed into CRM activities and not treated as a stand-alone process. As part of the PACCSAP-CBA project a combined CBA/CRM methodology was developed as shown below. CBA can be applied at the 'Problem Analysis' stage by determining the likely costs associated with risk and at the 'Solution Analysis' and 'Decision Making' stages by determining the costs and benefits of adaptation options. The methodology is similar for ex-ante and ex-post CBA\*.



\* See the Technical Report *Cost-Benefit Analysis for Food Security in Solomon Islands and Road Improvement in Vanuatu* for further methodological details on how to apply CBA for CRM – available on request or online.



#### Food Security in the Solomon Islands

In the first case study, CBA was applied to a food security project implemented in Choiseul Province, Solomon Islands by SPC (Secretariat of the Pacific Community) and USAID. A qualitative CBA was first used to analyse four adaptation options (conservation agriculture, built-up contour terraces, vetiver contour terraces, and conservation agriculture). A detailed CBA



was applied to improved agroforestry based farming for two communities of the Choiseul Province (one affected by flooding and one affected by drought). The ex-ante CBA analysis results estimated that for every dollar invested, the community received between two to five dollars in benefits.

#### Road Improvement in Vanuatu



In the second case study a detailed ex-ante CBA was applied to a Pacific Adaptation to Climate Change (PACC) project in North Epi Island. The CBA considered the costs and benefits of constructing a new road and making the existing network 'all weather roads' with concrete slabs, drainage and culverts. These activities will improve accessibility in response to landslides,

extreme rainfall and storms. The CBA demonstrated that for every dollar invested, about four dollars would be realised in benefits for the transport and agricultural sectors. Benefits to the health, education and employment sectors were also identified but could not be monetised due to a lack of data but are presented for consideration as qualitative benefits.



#### **Building Capacity - Lessons Learnt**

Despite the diversity of environments and the different project types investigated in the Solomon Islands and Vanuatu, applying CBA in a climate change context has yielded some common lessons:

- CBA can be used to weigh up the costs and benefits of large or small project. For large projects with sufficient data, a detailed CBA can be undertaken. For small projects or when significant data gaps exist, a qualitative CBA can be performed.
- Even if impacts of a project cannot be quantified (because they are uncertain, or data is unavailable), it is still important to capture any relevant qualitative impacts (such as environmental and cultural impacts) over the expected life of the project.
- Data required for CBA can be generated by utilising existing information, drawing on technical or regional experts and the knowledge of local communities.
- Communicating the results of a CBA is just as important as undertaking the analysis.
- CBA is best incorporated early in the project process. This enables the time to consult with stakeholders, collect data and appropriately inform a final decision.
- The CBA framework helps to identify knowledge gaps about the impacts of climate and non-climate risks and the expected benefits of adaptation.
- The application of CBA and CRM remains limited in the Pacific. Additional time and resources need to be dedicated to build the capacity of local technical staff to support CBA of climate adaptation options.

#### **Recommendations - Way Forward**

CBA has some restrictions, including limitations in its ability to fully incorporate non-monetary information such as intangible or qualitative values. However, it is considered the best available approach for systematically identifying, assessing and quantifying the costs and benefits of climate change adaptation investment decisions.

The following recommendations will assist in using CBA to support the management of climate risks and adaptation work in the Pacific:

- All projects can benefit from undertaking CBA.
- CBA should be integrated in existing project processes rather than being conducted as ad hoc or add-on activities. For example, CBA could be included as a requirement in project design documentation.
- Every project with a CBA should clearly document and communicate the results. Other information such as data sources, assumptions and limitations also need to be documented and communicated.
- Engagement with stakeholders, local experts and consultation with community representatives should be done as part of the CBA process to ensure all costs and benefits are captured.
- Sufficient time and resources need to be allocated to explain CBA and CRM concepts and tools to practitioners and stakeholders.
- Where capacity is limited, training sessions on CBA should be delivered as part of projects.
- A practitioner or government officer with economic skills should be included as part of a project inter-disciplinary team.

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### FAQs

What is the CBA Framework? The CBA framework is a generic term used to describe the practice of identifying and considering costs and benefits. The CBA framework may not necessarily use detailed quantified data inputs, but can rely on broader consideration of qualitative and quantitative measures of the different costs and benefits (economic, environmental or otherwise) associated with different adaption options.

**Can a CBA be completed without data?** Robust CBA relies on good information and data to reach a conclusion. Often it is not possible to obtain quantitative data for all aspects of a CBA (for example health and safety, or environmental values) in which case estimates or sometimes reasonable and defensible assumptions may need to be made. Ultimately, the more reliable the data that feeds into a CBA, the more reliable the outcome will be. Where there are too many estimates and assumptions the reliability of conclusions may be reduced.

Who should be involved in a CBA? Typically a CBA should include a person skilled in economic analysis, but also draw on the knowledge and experiences of local communities and subject matter specialists relevant to the policy or project being investigated.

Where can I find more information on CBA for Climate Risk Management? Development partners have recently developed a guide for *Cost-Benefit Analysis for Natural Resource Management in the Pacific.* The Technical Report prepared as part of this project *Cost-Benefit Analysis for Food Security in Solomon Islands and Road Improvement in Vanuatu* also provides additional details. Relevant documents can be found at www.environment.gov.au.

