



Regional Technical Assistance Report

Project Number: 41187
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Regional Partnerships for Climate Change Adaptation and Disaster Preparedness

(Financed by the Regional Cooperation and Integration Fund under
the Regional Cooperation and Integration Financing Partnership
Facility)

Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
GDP	–	gross domestic product
GIS	–	geographic information systems
PDMC	–	Pacific developing member country
RETA	–	regional technical assistance
SOPAC	–	Pacific Islands Applied Geoscience Commission
SPC	–	Secretariat of the Pacific Community
TA	–	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification	–	General intervention
Sector	–	Agriculture and natural resources
Subsector	–	Environment and biodiversity
Themes	–	Sustainable economic growth, environmental sustainability, regional cooperation
Subthemes	–	Addressing information and communication technology issues, global and regional transboundary environmental concerns and issues

NOTE

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

Vice-President	C. Lawrence Greenwood, Jr., Operations Group 2
Director General	S. Hafeez Rahman, Pacific Department (PARD)
Director	I. Bhushan, Pacific Operations (Area B), PARD
Team leader	E. Ferguson, Economist (Regional Cooperation), PARD

I. INTRODUCTION

1. The Pacific region is prone to natural disasters, experiencing droughts, earthquakes, floods, cyclones, landslides, sea surges, tsunamis, and volcanic eruptions. Each Pacific developing member country (PDMC)¹ faces a different set of risks and potential losses with respect to natural disasters. An increased awareness of climate change issues in the Pacific region has contributed to the view that the frequency and intensity of natural disasters may be increasing. This perception has been reinforced by the occurrence of recent major natural disasters such as the 26 December 2004 Asian tsunami, and the April 2007 Solomon Islands' earthquake and tsunami.

2. The *Pacific Regional Framework for Action for Building the Resilience of Nations and Communities to Disasters 2005–2015* was approved by the Leaders of Pacific Islands Forum countries in 2005.² It calls for “consideration of financial risk sharing schemes, particularly insurance and reinsurance and other financial modalities for risk transfer”, and its implementation is promoted through the Pacific Plan.³

3. In preparing the technical assistance (TA),⁴ an ADB mission participated in the October 2007 World Bank Small Islands States Forum where the role of catastrophe insurance schemes in building developing country resilience to natural catastrophes was discussed. The TA is designed to contribute to work being pursued by several development partners (including ADB) and led by World Bank to assess the feasibility of a catastrophe insurance scheme for the Pacific. There have been consultations between ADB and World Bank to discuss the scope of the work under the TA. Additional discussions have been held with insurance industry representatives and with development partners regarding a stronger approach to managing natural catastrophes in the Pacific region.

4. ADB and PDMCs have agreed on the intended impact, outcome, and outputs; and on the implementation and financial arrangements, cost, and terms of reference of the TA. The impact, outcome, and outputs are summarized in the design and monitoring framework (Appendix 1). Cost and financing arrangements are summarized in the cost estimates and financing plan (Appendix 2). The outline terms of reference form Appendix 3.

II. ISSUES

5. PDMCs regularly suffer the impacts of earthquakes and tsunamis, and other natural hazards that are exacerbated by human-induced climate change, including cyclones, droughts and floods. Natural catastrophes can have an enormous financial and economic impact on PDMCs. On average, the annual damage experienced by PDMCs is equivalent to between 2% and 7% of gross domestic product (GDP). However, in years that have included significant natural disasters, Samoa's economic losses have averaged almost 46% of GDP, the losses for Tonga averaged 30% of GDP, and the losses for Vanuatu averaged 14% of GDP. The replacement value of the damage caused by the 2007 earthquake and tsunami in the Solomon Islands is estimated at \$100 million, or around 80% of the 2007 budget. The potential social and economic dislocation caused by a natural catastrophe in a small island nation is extreme.

¹ The PDMCs comprise Cook Islands, Fiji Islands, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

² The 16 Pacific Islands Forum members include 13 PDMCs (Cook Islands, Fiji Islands, Kiribati, Marshall Islands, Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu) and Australia, New Zealand, and Niue.

³ Pacific Islands Forum Secretariat. 2005. *Pacific Plan for Strengthening Regional Cooperation and Integration*. Fiji Islands: Pacific Islands Forum Secretariat.

⁴ The TA first appeared in the business opportunities section of ADB's website on 1 June 2008.

6. Historically, PDMC governments have not paid much attention to hedging against such disasters largely because the most severe natural hazards occur infrequently, insurance against such events is either unavailable or prohibitively expensive, and when such events do occur there is a willingness on the part of donors to provide post-disaster funding.

7. Human activity-induced climate change is considered to raise the likelihood of catastrophic events in the Pacific region. ADB's climate risk studies in six PDMCs⁵ examined the likelihood of climate-related risks (high rainfall events and drought, high sea levels, strong winds, and high air temperatures). All climate-related risks showed increases as a result of global warming. There is already evidence of the impacts of climate change in PDMCs. For example, an increase in the frequency of severe cyclones has recently been experienced in Cook Islands, Fiji Islands, Samoa, and Vanuatu.

8. PDMCs have recognized the need to be better placed to respond to the impacts of what are becoming more frequent events. Climate risk management and adaptation measures (beyond disaster preparedness) to respond to climatic extremes are steadily being incorporated into national plans and development schemes with the support of development partners. However, having access to information is essential to be able to effectively plan for adaptation to climate change. This includes information about the probability of catastrophic events occurring in a particular location, an understanding of the value and ownership of assets threatened by natural disasters, and information about the likely economy-wide impacts of such events. Information also needs to be accessible and able to be easily manipulated by users.

9. In the Pacific region, information on major natural disasters is collected at a variety of locations within and outside the region. The Pacific Ocean's weather and seismic activity is variously observed by agencies based in Australia, Fiji Islands, New Zealand, and United States. This framework for catastrophe monitoring, while working effectively as a monitoring and warning system, means there is no single Pacific-wide snapshot of hazard risk. At the regional level hazard information collection and modeling is poorly developed in the Pacific, although the Pacific Islands Applied Geoscience Commission (SOPAC) has developed expertise and capacity in these areas.

10. World Bank is undertaking a TA in the Pacific region: the Pacific Catastrophe Risk Pool Initiative. The TA's objective is to ensure short-term liquidity to Pacific island states in the aftermath of natural disasters, through developing a menu of market-based financial solutions, including the creation of a regional catastrophe risk pool.⁶ During the first phase of the TA, data will be gathered and country-specific catastrophe risk models will be developed for a limited but representative number of countries: Cook Islands, Fiji Islands, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. These models will be used to develop country-specific loss risk profiles and to assess the feasibility of catastrophe risk financing and insurance options. This will act to collate sound geophysical information as a basis for an insurance scheme. ADB has also developed hazard risk data in the course of various projects and TA.

11. ADB is well placed to facilitate the consolidation of a regional hazard risk and exposure database given its in-depth knowledge of PDMCs, its relationships with donors, and its reputation with the private sector. ADB can play a catalytic role in compiling such information and supporting its use for policy making. It is envisaged that the TA will strengthen partnerships among PDMCs, development partners, and the private sector through creating a dataset which is of interest to these parties. The TA would also support the emphasis placed upon disaster preparedness in the Pacific

⁵ Climate risk profiles have been prepared for Cook Islands, Federated States of Micronesia, Fiji Islands, Kiribati, Marshall Islands, and Samoa.

⁶ World Bank. 2007. *Concept Note*. Washington, DC (10 March).

region by the Australian Agency for International Development and the European Union through providing improved information for decision-making.

12. The Pacific regional operations business plan (2007–2010) indicates ADB's commitment to working with other organizations to develop regional partnerships for climate change adaptation and disaster preparedness.⁷ ADB's involvement in this area would thus be a practical demonstration of its support to address the impacts of climate change.

13. There is further potential for partnerships on this issue. In conjunction with the Japanese Ministry of Finance, ADB will hold a conference on catastrophe insurance in November 2008 in Tokyo, Japan, which will be supported under the TA for Natural Catastrophe Risk Insurance Mechanisms for the Asia and Pacific Region (financed by the Japan Special Fund).⁸ Japan's role as a lead donor in the Pacific region has facilitated the inclusion of a workshop for PDMCs which will provide an opportunity to present the TA objectives to a wide audience.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

14. This impact of the TA will be mitigation of the financial risk of participating PDMCs from the effects of natural disasters, including those exacerbated by human activity-induced climate change. The outcome of this TA will be an improved geophysical information system that supports greater resilience to climate impacts and shocks through facilitating government decision-making on hazard exposure and risk minimization. The TA will also support an assessment of the feasibility of a regional pooled catastrophe insurance scheme and its subsequent development.

15. The use of the information system, once developed, will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. The outputs will support the work of the Pacific Islands Applied Geoscience Commission and national organizations in hazard risk management and vulnerability assessment. The outputs of the TA will also form a component of broader work on the feasibility of a catastrophe insurance facility for the Pacific region that is being led by the World Bank. The outputs of the TA will provide lessons for any replication undertaken in other sub-regions.

B. Methodology and Key Activities

16. The TA will support the development of up to eight national databases, and a consolidated regional database encompassing risk, hazard, and vulnerability data critical to the future development of a Pacific regional catastrophe insurance scheme and vital to inform government decision-making regarding adaptation to natural catastrophes.⁹ The PDMCs included are those most exposed to the risk of earthquakes and cyclones. The databases will build upon the information gathered by World Bank in their development of country-specific risk models. The database will utilize a geographic information systems (GIS) platform, already in use across the Pacific, to enable the easy manipulation of data for presentation that facilitates public policy and decision-making. This will contribute to improved geophysical information in the Pacific region.

⁷ ADB. 2007. *Regional Operations Business Plan Pacific (2007–2010)*. Manila: ADB.

⁸ ADB. 2008. *Technical Assistance for Natural Catastrophe Risk Insurance Mechanisms for the Asia and Pacific Region*. Manila (TA 6474-REG, approved on 6 August, for \$800,000)

⁹ The countries covered in phase 1 of World Bank's feasibility study (Cooks Islands, Fiji Islands, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu) will be the potential participants in the TA.

17. Database development will be conducted through national stakeholder consultations in each participating PDMC to build an understanding and awareness of the objectives of the TA and to assess the baseline situation in-country with regard to the compilation and use of hazard and risk information. This will be complemented through the collection and analysis of national information from hazard monitoring agencies both within and outside the region.

18. Ensuring maximum utilization of the information within the developed databases is critical to the longer-term success of the TA. The regular use of the information will help ensure that the databases are kept up to date. This will be promoted by involving policy makers, including representatives from central economic and planning agencies, in stakeholder consultations, meetings, and relevant training to develop an awareness of the type of information available and its range of uses. During implementation of the TA, regular consultations with stakeholders—including PDMCs—will be undertaken through various national and sub-regional meetings to be financed by the TA and from other sources.

19. In identifying and implementing an appropriate GIS platform, the systems already in use in each country will be assessed and coordination with regional bodies involved in implementing GIS programs, including the Secretariat of the Pacific Community (SPC), will be essential to ensure compatibility with existing systems. Compatibility will greatly expand the pool of potential users since a trained group of users will already be present in-country.

20. The final step will involve consolidating the national databases into a regional system. A web-based system for automatically uploading national updates to the regional database will be developed and made accessible through a standardized and centralized GIS platform. Towards the end of TA implementation, a regional stakeholder meeting will be held to assess outcomes and identify potential future actions.

21. The risks of the TA relate primarily to the availability of primary data and proxy data as required. Information is not located in each PDMC, but instead resides with various external agencies. As a result, collation, cleaning, and filling gaps becomes reliant on strong stocktaking to identify the sources of quality data, and upon the willingness of the holders of data to share information. These risks are reduced as significant data collation has already been done by the World Bank for use in their analysis of catastrophe insurance options. There is also a risk regarding the uptake and practical use of the information produced as a result of the TA by governments, regional organizations, and development partners. A lack of capacity at the national and regional level is a risk factor, with this risk being minimized by including training in the use of the data, and a strong focus on its policy uses, in stakeholder discussions. A strong consultative process in database development and buy-in by participating governments is needed to minimize such risks. The risk of insufficient country participation is considered low given that this TA was initiated at the request of PMDCs. In addition, an agreement on housing the regional database within a regional organization will be developed. SOPAC is the primary candidate for this role and has a strong track record in the area of disaster and risk management. This has been discussed with SOPAC which has expressed keen interest in housing the TA.

C. Cost and Financing

22. The TA is estimated to cost \$1,120,000. ADB will provide \$1,000,000 financed on a grant basis from the Regional Cooperation and Integration Fund under the Regional Cooperation and Integration Financing Partnership Facility. The participating PDMC governments will contribute a total of \$120,000 equivalent through the provision of counterpart staff, office space, meeting facilities, and administrative services. The cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

23. ADB, through its Pacific Department, will be the executing agency (EA) for the TA. The TA will be implemented over a 24-month period from January 2009–December 2010. The ministries of finance or planning will be the implementing agencies in each participating country.

24. The TA requires an estimated 25 person-months of international consulting services to be recruited through a firm by ADB using quality- and cost-based selection (with a simplified technical proposal), using an 80/20 weight for quality and cost. The team will comprise a team leader–risk assessment specialist (10 person-months), geoscientist (10 person-months), and a GIS specialist (5 person-months), all of whom will provide services intermittently. The consultants will be engaged in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time). The detailed terms of reference are in Appendix 3.

25. The team of consultants will work in close coordination with World Bank as the repository of the information collected during its initial catastrophe insurance feasibility study, and with SOPAC as the key repository of geophysical data in the region and potential home of the regional database. Coordination with SPC will also be important as SPC has established GIS platforms in all participating PDMCs as part of its demography and statistics program. Ensuring compatibility with existing systems will promote sustained system use.

26. The budget provides for computers and related equipment for participating PDMCs as required. The computers and equipment will be procured by the team leader, with prior approval from ADB's Pacific Department, in accordance with ADB's *Procurement Guidelines* (2007, as amended as from time to time), and will be kept by the PDMC after project completion. The international consultants will provide their own computers. Disbursements under the TA will be made in line with ADB's *Technical Assistance Disbursement Handbook* (2008, as amended from time to time).

27. Given the expected use of the database in each PDMC, the TA will be directly coordinated with counterparts from the ministries of finance and planning, although in each country a stakeholders committee will be developed to assess implementation of the TA and to support utilization and updating of the national database produced under the TA. The outcomes of the TA will be disseminated through a stakeholders' workshop involving representatives of participating countries and development partners. The workshop will also provide an opportunity to focus on the policy and decision-making use of the data compiled.

IV. THE PRESIDENT'S DECISION

28. The President, acting under the authority delegated by the Board, has approved the provision of TA not exceeding the equivalent of \$1,000,000 to be financed on a grant basis by the Regional Cooperation and Integration Fund under the Regional Cooperation and Integration Financing Partnership Facility for Regional Partnerships for Climate Change Adaptation and Disaster Preparedness, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
<p>Impact Mitigated financial risk of participating Pacific developing member countries (PDMCs) to the effects of natural disasters, including those exacerbated by human-induced climate change</p>	<ul style="list-style-type: none"> • Disaster mitigation measures in large national projects • Reduced demand for emergency financial assistance following natural disasters 	<ul style="list-style-type: none"> • National budgets of participating countries • Development partner reports • Monitoring of emergency requests 	<p>Assumptions</p> <ul style="list-style-type: none"> • Governments utilize geophysical information in decision-making • Geographic information systems (GIS) supports development of a catastrophe insurance facility
<p>Outcome Improved geophysical information that supports greater resilience to climate impacts and shocks</p>	<ul style="list-style-type: none"> • Access to geophysical information in key government departments and regional organizations • Geophysical information utilized by over 150 policy makers in the eight participating countries in the month following its completion 	<ul style="list-style-type: none"> • Technical assistance (TA) monitoring • Regional stakeholder meeting outcomes 	<p>Assumptions</p> <ul style="list-style-type: none"> • Ease of use of GIS • Wide access to GIS
<p>Outputs</p> <p>1. Up to eight national GIS encompassing hazard and vulnerability data</p> <p>2. A consolidated regional GIS encompassing hazard and vulnerability data</p>	<ul style="list-style-type: none"> • National geophysical information accessible by policy makers within 18 months of inception • Regional geophysical information accessible to regional advisers 20 months after inception 	<ul style="list-style-type: none"> • TA monitoring 	<p>Assumptions</p> <ul style="list-style-type: none"> • Sufficient national level data available • PDMCs facilitate access to primary data • Sufficient countries participate to warrant a regional GIS <p>Risk</p> <ul style="list-style-type: none"> • Proxy data insufficient to cover any data deficits at the national level
<p>Activities with Milestones</p> <p>1.1 National stakeholders consultation in each participating country (February 2009)</p> <p>1.2 Collection and analysis of national information (January 2010)</p> <p>1.3 Compilation into national geophysical information system (April 2010)</p> <p>2.1 Consolidation of national geophysical information system into a regional GIS (June 2010)</p> <p>2.2 Regional stakeholder meetings (February 2010 and October 2010)</p>			<p>Inputs</p> <ul style="list-style-type: none"> • ADB: \$1 million and 12 weeks of staff time • Governments: 2 weeks equivalent staff time in each participating PDMC • Consulting services (25 person-months international)

ADB = Asian Development Bank, GIS = geographic information systems, PDMC = Pacific developing member country, technical assistance (TA).

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Total Cost
A. Regional Cooperation and Integration Fund under the Regional Cooperation and Integration Financing Partnership Facility^a	
1. Consultants	
a. Remuneration and Per Diem	
i. International Consultants	530.0
b. International and Local Travel	120.0
c. Reports and Communications	20.0
2. Equipment ^b	70.0
3. Training, Seminars, and Conferences	
a. Training Program	160.0
4. Miscellaneous Administration and Support Costs	20.0
5. Contingencies	80.0
Subtotal (A)	1,000.0
B. Government Financing	
1. Office Accommodation and Transport	30.0
2. Remuneration and Per Diem of Counterpart Staff	80.0
3. Others	10.0
Subtotal (B)	120.0
Total	1,120.0

^a Administered by the Asian Development Bank.

^b Equipment comprises computers and software required to support the use of databases within a geographic information systems platform at the national and regional levels.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The technical assistance (TA) requires an estimated 25 person-months of international consulting services intermittently. This will be recruited through a firm by the Asian Development Bank (ADB) using quality- and cost-based selection (with a simplified technical proposal), using an 80/20 weight for quality and cost, and will comprise: a team leader–risk assessment specialist (10 person-months, intermittent); geoscientist (10 person-months, intermittent); and a geographic information systems (GIS) specialist (5 person-months, intermittent). The consultants will be engaged in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time).

A. General Terms of Reference

2. International consultants will ensure that all TA works and outputs are fully compliant with relevant ADB policies and guidelines. The team will be fielded together for the inception mission and will coordinate their respective work programs. The inception report will be submitted at the end of the first month of TA implementation and will include a detailed work plan, a preliminary outcome of work undertaken, and the future direction of the TA. A stakeholder meeting will be called by ADB to discuss the inception report. Timing and work programs of the inception and subsequent consulting missions will be coordinated with the executing agency (EA) (ADB's Pacific Department) and participating Pacific developing member country (PDMC) governments.

B. Specific Terms of Reference

1. **Team Leader–Risk Assessment Specialist** (international, 10 person-months, intermittent)

3. The team leader–risk assessment specialist will have a master's degree in geography, science, engineering or a similar field. The specialist will have at least 15 years relevant professional experience, including experience in developing countries, in assessing risk arising from natural catastrophes. The specialist will be an excellent communicator and have a demonstrated track record in leading multidisciplinary teams. Relevant experience in PMDCs would be an asset, as would experience in use of consultative and participatory processes.

4. The team leader–risk assessment specialist will carry out the following duties and responsibilities:

- (i) Develop a detailed TA implementation plan.
- (ii) Lead consultations with data providers and data users.
- (iii) Provide overall guidance for the creation of the database framework, in cooperation with the geoscientist and GIS specialist.
- (iv) In cooperation with the geoscientist, populate country databases.
- (v) Coordinate implementation of country consultations, meetings, and training programs.
- (vi) Provide overall guidance to the development of a regional database through consolidation of national databases.
- (vii) Provide overall guidance for the creation of regional workshop content and materials in cooperation with the geoscientist and GIS specialist, and directly implement components of this as appropriate.
- (viii) Direct the implementation of the TA, with particular regard to:

- (a) ensuring a shared understanding of TA activities and objectives among the various specialists and in accordance with ADB understanding;
- (b) coordinating the TA inputs from various specialists; and
- (c) coordinating and contributing to the progress reports, draft final report, final report, and output documents from country and regional activities.

2. Geoscientist (international, 10 person-months, intermittent)

5. The geoscientist will have a master's degree in science, or a similar field, focusing on natural catastrophes. The geoscientist will have at least 10 years relevant professional experience, including experience in developing countries, in assessing and modeling the impact of natural catastrophes. Relevant experience in PDMCs would be an asset, as would experience in the use of consultative and participatory processes.

6. The geoscientist will carry out the following duties and responsibilities:

- (i) Participate in consultations with data providers and data users.
- (ii) Contribute to the creation of the database framework, in cooperation with the team leader and GIS specialist.
- (iii) In cooperation with team leader, populate country databases.
- (iv) Assist in the implementation of country consultations, meetings, and training programs.
- (v) Assist the team leader in the development of a regional database through consolidation of national databases.
- (vi) Assist in the creation of regional workshop content and materials in cooperation with the team leader and GIS specialist, and directly implement components of this as appropriate.
- (vii) Contribute to the progress reports, draft final report, final report, and output documents from country and regional activities.

3. Geographic Information Systems (GIS) Specialist (international, 5 person-months, intermittent)

7. The GIS specialist will have a master's degree in geography, demography, science, or a similar field, focusing on GIS applications. The geoscientist will have at least 10 years relevant professional experience, including experience in developing countries, in implementing GIS applications. Relevant experience in PDMCs, as would experience in the use of consultative and participatory processes and in training and capacity development

8. The GIS specialist will carry out the following duties and responsibilities:

- (i) Assess current status of GIS usage in participating countries and any planned expansion.
- (ii) Identify and procure the appropriate GIS platform to support use of the national and regional database.
- (iii) Place national databases onto the GIS platform and, as much as possible, integrate this with existing GIS uses in each country.
- (iv) Develop a web-based linked system to allow for the automatic updating of national and regional databases.
- (v) Provide in-country training in the use of GIS.
- (vi) Develop user manuals as appropriate.
- (vii) Contribute to the progress reports, draft final report, final report, and output documents from country and regional activities.