



# PREEN newsletter

Pacific Resource and Environmental Economics Network

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It is with great pleasure that we present to you the June 2011 edition of the PREEN Newsletter. New REE activity in the Pacific during the past six months includes the launch of a new blog at the SPC Land Resource Division, numerous new publications and several snippets concerning events and research news. We hope you will enjoy our selection of Pacific REE updates and we thank you for your Newsletter contributions.

All the best,

Federica Gerber

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## Process, Practice and Priorities in Investigating Post Disaster Economic Resilience: Lessons Learnt from the 2009 Samoa Tsunami

This paper examines how the September 2009 South Pacific tsunami has had a lasting impact on local coastal villages and global collaborative research efforts. Locally, the impact of the tsunami was one of the most severe disasters Samoa has experienced in the last few decades. Researchers came from all over the world to participate in the UNESCO International Oceanographic Commission (IOC) Samoa International Tsunami Survey Team (ITST).

Focusing on the need for interdisciplinary research a socio-economic impact assessment team (SIT) was expressly invited to participate in identifying the priorities for post-disaster economic resilience. Within days of the tsunami, a group of Australian, New Zealand, American, Fijian, and Japanese disaster researchers began to discuss how they might develop a social science reconnaissance research plan using innovative approaches and best practice in achieving economic resilience to tsunami.

This paper presents an overview of challenges faced by the socio-economic impact assessment team, noting lessons learned. It contributes to the limited literature that outlines how to develop responsible plans and processes for post-tsunami disaster work concerned with investigating post disaster economic resilience in Pacific island rural, ocean side communities. Importantly, Australia's Emergency Management Disaster Loss Assessment Guidelines helped establish a list of intangible and indirect loss indicators. These indicators describe the socio-economic and longer-term impacts from a given tsunami, and use field observations and interview experiences to identify a wide array of indirect and intangible loss indicators. Finally the paper provides useful and new information relevant to a number of hazards, such as flooding, cyclones, earthquakes, bushfires, pandemics and terrorism.

Full paper can be downloaded at [www.sciencedirect.com/science/article/pii/S0012825211000365](http://www.sciencedirect.com/science/article/pii/S0012825211000365)

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## Study of destructive fisheries in Kiribati

The study reviews the fishing methods and practices used by the people of North and South Tarawa highlighting those which are considered to be destructive and analyses their economic and social consequences. The study provides a socio-economic evaluation of current practices and analyzes the consequences for coastal communities of Tarawa. The assessment suggests the need for a more effective fisheries management regime for Kiribati which, in turn, will require regulatory and policy change to reduce the level of fishing effort to achieve sustainable fisheries. A possible pathway for such changes is suggested to enable the communities, if they wish to adopt greater responsibility and governance over their fishing practices and livelihoods.

The key findings of the study can be summarized as follows:

- Use of multiple gillnets is becoming more widespread with splash method commonly known by commercial fishermen as te ororo;
- Coastal fisheries generally have no catch limits and are practically considered as open access fisheries;
- Over the next 26 years – during which time which 75 per cent of the reefs would be damaged – the cost of destructive te ororo is estimated at A\$76.34 million in total, or A\$3 million annually;
- Fishing pressure could be reduced by imposing restrictions on fishing methods and areas, diverting effort to oceanic areas and in non-fishery sectors, mariculture and possible use of Fish Aggregation Devices and artificial reefs;
- Careful design of appropriate institutional frameworks to empower coastal communities regarding fishery management is essential;
- A wide consultation is necessary in the formulation and development of a comprehensive Fisheries Management Plan

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## Economic Assessment of Water Safety Planning: Niue

Current water quality practices in the PICs are strongly focused on meeting standards for treated drinking water and on compliance monitoring by testing the end product. However, over the years a number of limitations became apparent, such as the fact that these tests did not prevent contaminated water from being distributed. To address these issues, the WHO proposed in 2004 the introduction of Drinking Water Safety Plans (DWSP), a proactive approach to the management of the water supply, nevertheless placing emphasis on the identification and monitoring of risks and hazards to ensure that measures are taken to consistently minimize or eliminate the potential for the realization of these risks.

In the case of Niue, present water supplies are considered safe and are piped to 100 per cent of the population, the groundwater source remains highly vulnerable to surface activities and other threats. A recent economic analysis of the Niue DWSP indicates that investing in DWSP in the country starting now is likely to be beneficial to Niue, generating a potential return of NZ\$1.20 will be generated for every dollar invested. However, as the Government anticipates the implementation costs being funded externally, the Government expects to directly bear only the operational cost of the DWSP. As the Government covers all medical and water supply costs on Niue, returns to Government of avoided health and system leakage costs are estimated to be around NZ\$2.90 on every dollar invested. The economic analysis also highlights a variety of policy issues relevant to water management in Niue, such as the lack of data on continued threats to the water system.

Deveraux Talagi, Junior Economist, SPC-SOPAC.

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## The Design of a Global Revenue Neutral Carbon Tax and Majority Voting

Under the threat of human-induced climate change, it has been popularly suggested that a global revenue-neutral carbon tax could be used to support any proposed international agreement to reduce carbon emissions. Although it is generally claimed that this sort of tax could be acceptable to the majority of nations, this paper works from the premise that a global carbon tax should adhere by certain criteria, i.e. it should be progressive, revenue neutral and should include a tax credit. What the tax credit implies is that nations with low CO<sub>2</sub> emissions would receive a positive amount of money from the system and that only nations with high per capita emissions would have to pay.

As an example, if this global carbon tax rate was US\$165 per ton of CO<sub>2</sub>, 2.5 tons per capita would remain untaxed and around 1 per cent of the world gross domestic product would be redistributed from the developed nations to the less developed nations. In this way, the 0.7 per cent of GDP development aid target of the Millennium Goals will be realized and, in addition, it would be possible to maintain a scientifically acceptable global temperature increase of 2 degrees Celsius over the next 40 years. Specifically, for Pacific Island Countries like Fiji, Niue, Samoa, Papua New Guinea and Tonga – all of which have lower levels of GDP – such a tax-credit system aims to provide an average net payment per capita of between US\$321 and US\$577 per year. This paper shows that the inequalities between GDPs in different countries must be taken into account with regards to the design of a global carbon tax-credit system.

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## Economics Research for New South Wales Marine Parks

The New South Wales system of marine protected areas encompasses six multiple use marine parks, 12 aquatic reserves and 62 national parks and reserves with marine components. Marine parks in NSW are zoned for multiple activities, including recreational and commercial fishing, diving, boating, snorkelling and tourism. The Marine Parks and Aquatic Reserves in NSW can be found mapped at [www.mpa.nsw.gov.au/pdf/NSW-Marine-protected-areas.pdf](http://www.mpa.nsw.gov.au/pdf/NSW-Marine-protected-areas.pdf)

The NSW Marine Parks Authority (MPA) has recently released three reports which estimate the economic impacts of proposed changes to the zoning arrangements for The Solitary Islands Marine Park (on the NSW North Coast) and the Jervis Bay Marine Park on the NSW South Coast.

In the case of the Solitary Islands Marine Park, one study examined the impacts on the local economy of the surrounding region using the regional economic impact assessment techniques of input-output analysis, shift-share analysis and use of location quotients. A second study for the Solitary Islands Marine Park and an study for the Jervis Bay Marine Park estimated potential changes in the economic value of the marine parks for commercial and recreational fishing and a range of tourism/visitor attractions, following proposed revision of the parks' zoning arrangements.



Solitary Islands Marine Park. NSW Marine Parks Authority

The proposed changes to the two marine parks involved a reduction in access to marine park areas for commercial fishing, and a programme of selected buy-outs for fishing businesses likely to be affected by the loss of access. The buy-out process also enables structural adjustment to occur in the commercial fishing industry in the affected regions.

These studies were used by the MPA to help finalise changes to the zoning plans for the two marine parks which were approved by the NSW government in March 2011, and are now being implemented.

For more information on these two reports, please contact [nicholas.conner@environment.nsw.gov.au](mailto:nicholas.conner@environment.nsw.gov.au) or download the full reports at [www.mpa.nsw.gov.au/pdf/simp-economics-report-2011.pdf](http://www.mpa.nsw.gov.au/pdf/simp-economics-report-2011.pdf) and [www.mpa.nsw.gov.au/pdf/jbmp-economics-report-2011.pdf](http://www.mpa.nsw.gov.au/pdf/jbmp-economics-report-2011.pdf)



## Desalination in the Pacific Island Countries: A Preliminary Overview

Although it is known that desalination technologies have been used in the Pacific since the 1990's, there is very little available documented information on the extent of use and the success of the technologies in the Pacific. This paper brings together Pacific Island Countries' (PICs) experiences with desalination and provides a preliminary assessment of the suitability and potential for desalination in PICs. Methods of desalination are outlined, as well as an overview of known desalination plants and experiences in the PIC. Two preliminary case studies are described based on different desalination technologies to illustrate the minimum expected cost of desalination, along with a preliminary assessment of the estimated cost of rehabilitating typical community rainwater harvesting catchments for comparison. The paper observes that desalination in general is a very costly alternative to traditional methods of water production, having high capital and operational costs, the latter appearing to be a critical factor in the failure of systems in the PICs. Indications are that a significant number of desalination plants fail in a relatively short time after installation.

The paper recommends that a more in-depth study be undertaken of desalination units in the Pacific, to further identify the factors which contribute to their success or failure to provide important data for use in decision making to ensure the viability and sustainability of future plans.

Alan Freshwater and Deveraux Talagi, SPC-SOPAC.

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## Establishment of a DRM Fund in the Cook Islands

A new Policy for Disaster Risk Management (DRM) drafted by the Office of the Prime Minister (OPM), in collaboration with Emergency Management Cook Islands (EMCI) and Ministry of Finance and Economic Management (MFEM) was presented to National Disaster Risk Management Council, chaired by the Prime Minister, Henry Puna. Included in the new Policy is a recommendation that 2 per cent of the national budget be set aside for an Emergency Fund during a disaster in the Cook Islands.

The Prime Minister requested that MFEM look at ways where the Cook Islands can become self reliant, generating new income streams to fund a pool specifically for Disaster Management (DM) response and recovery. It is hoped that this will improve response times as currently the Cook Islands, like many other Pacific Island Countries, is heavily reliant on donors.

Although the establishment of a DRM fund was fully supported in principle, the reality was that there are other pressing priorities (infrastructure, education, health, water and sanitation, etc.) competing for the same pool of government funding. Towards this end, the Prime Minister, as Minister for EMCI, requested the possibility of exploring various options of generating its own fund from, say, taxing petrol a certain portion which would then go towards the Emergency Fund.

The EMCI requested the Applied Geoscience and Technology Division's (SOPAC) support to help draft a feasibility assessment for a variety of options available to the Government of the Cook Islands to establish an Emergency Fund. The main challenge was to develop a concept note and detail the various options that can realistically create an Emergency Fund that is both sustainable and fulfils its primary objective.

The options paper produced was presented to the Prime Minister during the first half of March and then passed to Cabinet in May. The Cabinet agreed to allocate the funds to establish a Disaster Management Fund which leaves the remaining challenge of developing the policy, structure and legal framework.

For further information, please contact Samantha Cook at [samantha@sopac.org](mailto:samantha@sopac.org)



## IFRECOR meeting in Paris on coral reef economic valuation

On the 12 and 13th of May 2011, a technical meeting was held in Paris on the economic valuation of coral reefs and associated ecosystems. More than 15 experts forming part of the steering committee of the economic project of IFRECOR (French Initiatives for Coral Reef Ecosystems) were present. The objective of the workshop was to define a standard approach and methodology to economically value coral reefs and their associated ecosystem services in all twelve French territories, including those in the Pacific. Valuation will be done during the next 2 years by different teams specialized in the valuation of direct use values, indirect use values and amenity values. The results of the valuations will be used to design strategies to inform and persuade both the French national and the local governments in economic management tools (PES, taxation, etc.). Discussions on existing values and potential sustainable values were also addressed in the meeting to transmit clear information to decision-makers. Some valuation issues were identified as indirect uses (e.g. coastal protection, water treatment) and specific actions will be undertaken to address these issues such as development of simple biophysical models through GIS. The proceedings of the meeting and a consequent technical guide will be available in mid-July 2011.

For further information, please contact Nicolas Pascal at [nicolas.pascal@criobe.pf](mailto:nicolas.pascal@criobe.pf)

## Social and Economic Values for Making Informed Choices to Support DRR and CCA

This talk was given by IUCN during the DCCEE-SPREP organised Conference on Lessons for Future Action: Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) in Small Island States, in Apia during May 16-19th. This conference focussed on sharing lessons learnt and experiences gained in addressing climate change adaptation and disaster risk reduction in the Pacific and the Caribbean regions. It covered plenary and working group discussion covering thematic areas such as National Planning and Policy, Information and Awareness, Community Based Responses to CCA and DRR, Strategies and On-ground Options, and Capacity development for CCA and DRR.

Drawing on four case studies currently being undertaken by IUCN in partnership with SOPAC, and the review of other DRR and CCA projects in the Pacific, Dr Padma Lal highlighted the role and relevance of economic and social assessment in making informed decisions at the planning and budgetary level and when choosing CCA/ DRR options in the Pacific. She emphasised the importance of not only explicitly considering economic and social values in DRR and CCA decisions at least adopting cost benefit analytical framework but also the importance of strengthening governance arrangements (organisations structures, decision-making processes, the institutional 'homes' and the budgetary process that govern the work undertaken at the sectoral and community levels) for supporting climate compatible development. The Conference involved representatives from the Pacific island countries, key regional organisations as well as from CARICOM, and Caribbean Community Climate Change Centre.

For further information about the talk, please contact Dr Padma Lal at [padma.lal@iucn.org](mailto:padma.lal@iucn.org)

## Economic Valuation of Disasters

During March a regional workshop was held in Port Vila, Vanuatu to share information on how to value disasters. This is the first workshop of its kind in the Pacific Region. The workshop provided a chance for representatives from the Ministry of Finance/ Planning and the National Disaster Management Offices from a variety of Pacific Island Countries (PICs) to hear more about the Damage and Loss Assessment (DALA) framework favoured by many donors. The DALA framework was originally developed in the Caribbean some 40 years ago and has undergone extensive refinement and use over the years. It was trialed in the Pacific for the first time in 2009 following the tsunami in Samoa to help give an accurate reflection of the cost of the damage and losses.

This workshop shared with planners and disaster managers an approach to putting a value on disasters. The idea for this came from discussions with three different agencies being approached by PICs who expressed interest in valuing disasters in order to advocate for improved investment in disaster risk management. In order to ensure consistency in the region the three agencies, SOPAC, UNESCAP and UNISDR decided to combine their efforts in to this regional pilot and seek support from UNECLAC and the World Bank GFDRR. This workshop is therefore a joint effort to discuss valuing disasters in the Pacific

Interest in learning more about the DALA for use in the Pacific was mixed. A workshop report is currently being prepared, following this consultations will be held PICs and national, regional and international agencies to establish how to assist interested countries to access hands on training and guidance to use DALA.

For further information please contact Paula Holland [paulah@sopac.org](mailto:paulah@sopac.org)



Participants at the March 2011 disaster assessment workshop in Vanuatu

## MESCAL Project and Economic Valuation of Mangroves in Five Pacific Island Countries

IUCN is undertaking an action research and development on Mangrove EcoSystem for Climate Change Adaptation and Livelihood, focusing on strengthening co-management of mangroves in five participating countries, Fiji, Samoa, Tonga, Solomon Islands, and Vanuatu. It also includes a research subcomponent on the economic valuation of mangrove ecosystem services. The results of the economic study, which is due to commence later this year, together with other action research components including legal and policy analysis, will be used to support 'top-down' and 'bottom-up' co-management governance design in each of the countries. The economic valuation studies are also expected to help increase awareness about the importance of coastal mangroves for livelihood, for reduced disaster risk and climate change as well as biodiversity and other cultural values. This €2.3 million is funded by the German Government under its International Climate Initiative, is due to be completed in late early 2014.

For further information about the economic valuation study, please contact Dr Padma Lal at [padma.lal@iucn.org](mailto:padma.lal@iucn.org)

## Economics of Meteorological Services for Disaster Management

In April 2011, SOPAC/SPC signed a Memorandum of Understanding with the World Meteorological Organisation (WMO) and SPREP to conduct work on a preliminary economic analysis of improved weather and climate services in the Pacific. SOPAC observes that at least 44 per cent of disasters reported since 1970 were hydrometeorological (weather/ climate related) in nature. As a result, strong weather and climate services are critical for Pacific island countries to predict negative events and develop strategies to cope. Unfortunately, WMO observes that the Pacific often struggles to maintain national meteorological/hydrological services, cautioning that, if not addressed, critical services – such as the generation of tropical cyclone warnings – could be jeopardized and disasters increase.

WMO hopes that the analysis conducted by SOPAC/SPC will provide evidence of the nature and potential value of investing in improved weather services and strengthen arguments for investing in improving the services as well as their institutions. SOPAC/SPC adds that the analysis should also identify preconditions to realise and or maximise benefits in the future (identifying enabling environment/ policy issues).

Preliminary findings of the analysis and a draft report are anticipated to be available for review in late 2011.

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## Tuvalu: Economic Study of Water Security for Climate Change Adaptation Commences

Water is a critical issue in Tuvalu, a Pacific island atoll nation where groundwater has been declared unsafe for human consumption due to high salinity and pollution. As a result, rainwater is a key water source on the 8 inhabited atoll islands.

Unfortunately, the annual drought, which can last for up to 3 months, results in a scarcity of water with consequent frustrations and health problems in Tuvalu. This is especially the case on the capital atoll of Funafuti where most of the Tuvaluan population resides. Such drought episodes might be worsened by the effects of climate change.

As a result, there are a number of climate change adaptation projects underway to assist Tuvalu build capacity to improve water supplies, including work on rainwater tanks, composting toilets and awareness-raising. Learning from the experiences of these projects will be crucial in designing climate change adaptation projects in the future. Consequently, SOPAC/SPC – on behalf of the IUCN-Oceania Regional Office – is undertaking an economic study of three projects: (i) the SPREP-executed Pacific Adaptation to Climate Change (PACC) project, (ii) the SPC/SOPAC-executed disaster risk management (EU B-Envelope) project, (iii) the SPC/SOPAC-executed GEF-IWRM project. The findings of the study will be used by IUCN to generate lessons learned in the socio-economic dimensions of climate change adaptation project design and will benefit the DCCEE funded project on 'Economic and social values of CCA and DRR: strengthening knowledge based climate change adaptation.

To collect data for the analysis, Federica Gerber – Natural Resource Economist of SOPAC – visited Tuvalu at the end of April. Following several meetings with community members and government representatives to collect data, formal economic analysis is now underway and preliminary results on the value and lessons from the 3 projects are expected in August 2011. The final report is due to be released in October, and after which time IUCN and SPC/SOPAC looks forward to sharing findings and recommendations with key stakeholders, including the Tuvalu Government.

For more information please contact Federica Gerber at [federica@sopac.org](mailto:federica@sopac.org)



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## North Pacific ACP Renewable Energy and Energy Efficiency Project: Preparing for the Economic & Social Impact Assessment

The North Pacific ACP Renewable Energy and Energy Efficiency Project (North-REP) launched earlier this year aims to improve the overall efficiency of the energy sector through energy efficiency and grid-connected renewable energy in three island member countries of the Secretariat of the Pacific Community (SPC); Federated States of Micronesia (FSM), Palau and Republic of Marshall Islands (RMI). The EUR14.4 million project aims to improve the quality of life on the outer islands (RMI, FSM) and to reduce dependency on fossil fuels (RMI, FSM, Palau).

This project is an opportunity to demonstrate the benefits that can be derived from focused, appropriate and sustainable energy planning and intervention, and also an opportunity to learn more about the application of renewable energy technologies in the Pacific and its impact on sustainable economic development.

As part of the project, the Economic Development Division (EDD) at SPC will undertake an ex post evaluation of the project to assist in advocating for renewable energy investment by:

- 1) Providing evidence of the socioeconomic value of investing in renewable energy and energy efficiency;
- 2) Providing a business case for up-scaling and replicating such activities; and,
- 3) Contributing to the existing body of empirical research in the field of energy initiatives in developing countries.

The assessment has been structured into four phases. Phases 1 and 2, which include establishing the framework for data collection; identifying relevant socio-economic variables; stakeholder consultations; and baseline country sample surveys are current activities. Over the next few months, the collection of quantitative and qualitative data will commence thus providing the baseline to access to energy source, fossil fuel dependency and energy efficiency in the three countries. A wide consultation of local key stakeholders will be part of the process to collect key information on biomass, fossil fuel and electricity consumption, the cost and utilisation of these fuel sources; and the overall awareness of energy efficiency.

To ensure that the success of North-REP has longevity, this area will require careful consideration. Phases 3 and 4 of the project will reflect ex post assessment and report writing. The North-REP is funded by the 10th European Development Fund.

For further information, please contact Uzumma Erume at [uzummaE@spc.int](mailto:uzummaE@spc.int)

## Payment for Ecosystem Services: Water and Nature Initiative (WANI) – Samoa

Under the IUCN project on Water and Nature Initiative (WANI), an economic valuation study is currently underway to determine the potential use of payment for ecosystem services (PES) for managing the Togitogiga waterfall area in Samoa. At its peak flow generates majestic cultural values. There are several water holes enjoyed by locals and international visitors for swimming and diving. The site is maintained by the Forestry Department, providing recreational facilities, such as barbeque area, picnic spots and toilets and change room. As part of the Togitogiga catchment management the Samoan Government is considering introducing visitor charges for the waterfall. The objectives of the economic project include to:

- estimate the non-market economic values associated with ecosystem services - the aesthetic, recreation and educational values (i.e. regulatory ecosystem values) – and their relevance to the PES for the Togitogiga waterfalls; and,
- identify key principles to underpin, and the institutional design prerequisites for, an effective payment for ecosystem services (PES) for the Togitogiga waterfalls, recognising the existing resource tenure, government organisational arrangements, and jurisdictions and resourcing arrangement for the water fall site management.

The project is expected to be completed by December 2011.

For further information, please contact Dr Padma Lal [padma.lal@iucn.org](mailto:padma.lal@iucn.org)



## Land Resources Department Economics Blog

SPC's Land Resource Division has in 2011 commenced posting notes and interesting or useful articles/ reports related to work of the LRD. Bower will email those interested every 2-4 weeks to update on any posts.

Notes and articles will be posted on the following sites, which are connected directly to the site <http://lrdeconomics.wordpress.com/>

[Oxfam: Price of key crops to rise by 180%, Implications for Pacific](#) – a report released in May 2011 by Oxfam about the impact of climate change on food prices, and a brief exploration of the economic implications for consumers, farmers and the state in the Pacific.

[Asian Development Outlook 2011 on Pacific Agriculture](#) – quotes from the Asian Development Outlook 2011 regarding agriculture and food prices in individual Pacific countries.

[Agricultural Fundamentals in the Pacific](#) – analysis of three charts about the fundamentals of agriculture in Pacific countries e.g. proportion of agriculture in GDP; proportion of arable land.

[New Pacific Trade Statistics Database](#) – a post from Rajhnael Deo about the Pacific Trade Statistics Database and its huge potential.

For further information on the postings/ articles, and to provide feedback or articles to post on the site itself, please contact Jonathan Bower at [jonathanB@spc.int](mailto:jonathanB@spc.int)



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We look forward to receiving feedback and articles from our readers

Please send these to [federica@sopac.org](mailto:federica@sopac.org)

The Pacific Resource and Environmental Economics Network...

Aims to progress economic analysis for sustainable resource management in the Pacific by providing a forum for practitioners in Pacific resource and environmental economics to exchange information, ideas and experiences for mutual learning and professional development.