



Second Meeting of the SOPAC Division Noumea, New Caledonia, 3-9 November 2012 (SOPAC-2)

AGENDA ITEM	TITLE
2	REPORTS
2.3	Division Work Programme Implementation Highlights 2012

Purpose and Background

The purpose of this paper is to provide a summary of selected highlights from the work programme delivered over the past year. For further information and a report on all work undertaken a full extended narrative report is available for each of the three main technical work programmes.

French Polynesia: Tuamotu Archipelago – Reducing the Risk of Storm Wave and Surge

French Polynesia experiences major natural hazards, some of which are potentially very damaging to infrastructure and the economy. Likewise, such storms can present significant direct threats to human wellbeing and have resulted in loss of life. In response, French Polynesia has introduced a risk prevention policy including regulations designed to provide a higher level of protection during natural disasters. Such regulations are based on scientific data that is used to assess risk-prone areas however given topographic and bathymetric data and associated modelling of extreme wave/surge impacts have not been widely available in outer island areas such as the Tuamotu Group, improved assessment of such hazards has not been undertaken.

The *Supporting Disaster Risk Reduction in Pacific Overseas Countries & Territories* Project is implemented by the SOPAC Disaster Risk Reduction Programme (funded under the 9th European Development Fund – C Envelope) and partners with the OIP for delivery in French Polynesia. Under the framework of French Polynesia's national disaster risk prevention policy, this collaborative activity between the DRP, OIP and French Polynesia Authorities seeks to provide an accurate definition of the inundation hazard from tropical cyclone waves in select areas of the Tuamotu archipelago. The results will feed into revised land use and disaster plans, with a view to enhancing community safety and protecting coastal infrastructure. Application of the data also extends to the pearl culture and tourism industry, environmental protection and maritime security.

The OIP has already completed an extensive program of work including bathymetric, oceanographic and topographic surveys and data collection in five atolls (Rangiroa, Manihi,

Kauehi, Arutua and Apataki) in 2011 / 2012. Efforts are now underway to process and analyse the data to enable the development of cyclone wave models and inundation maps. This work led by OIP will test new numerical modelling tools such as *Xbeach*, which models wave transformation over fringing reef environments common in the tropical Pacific. Fringing reef environments can present complex problems to numerical modelling software as the model must be able to compute the efficiency of the fringing reef in reducing wave energy and how much energy is subsequently transferred over reef flats to the shoreline of the island. These new modelling tools combined with high quality baseline data lend themselves to this complex task and once established can be easier replicated in other similar environments and locations across Pacific. As OIP delivers this work it is also standardising such methods and procedures to better facilitate future modelling and improve efficiency and accuracy in future projects.

This exciting and major body of work continues and it is envisaged that by late 2012, several technical reports, a cost benefit analysis, bathymetric maps and inundation models (1D and 2D) will be available. However, final model and assessment products will not be complete until mid-2013.

Fiji: An Integrated Approach to Water Resources and Flood Management in the Nadi Catchment

The Fiji floods in January and March 2012 reinforced the need for integrated flood management strategies to minimise the impacts of flooding in the affected areas. This was also demonstrated in previous flooding experiences of 2009 where Government reported damages at US\$60 million.

To address this in the Nadi catchment, the GEF funded IWRM project executed by SOPAC together with the Government of Fiji's Department of Agriculture are implementing an integrated ridge to reef approach which amongst other things includes the establishment of the Nadi Basin Catchment Committee (NBCC) to oversee and coordinate project implementation.

In 2011, the World Bank expanded the scope of work by providing additional funding to specifically address flood risk in the catchment along with ongoing support already being provided through the EU funded IWRM National Planning Programme, the AusAID National Action Plan Facility, and most importantly the sustained support of national agencies and partners working in the Nadi Basin.

This joint effort is contributing towards improved flood forecasting and early warning, floodplain zoning and regulations, community awareness, developing ridge to reef catchment guidelines and strengthened institutional capacities and arrangements for water resources and flood management in the Nadi catchment with a view to this being replicated in other catchments where applicable. An illustration of this joint support has included flood impact assessments measuring peak flood heights and flows and flooding extent in the greater Nadi area to inform the flood preparedness and response.

Federated States of Micronesia: Construction of Emergency Operations Centres and DRM Training Provided

The B Envelope Project has provided support to the FSM to strengthen early warning system networks and renovate Emergency Operation Centres (EOCs) in each of the four State. The renovation works for the Emergency Operation Centres in Yap, Kosrae, Chuuk and Pohnpei States have been completed. The construction of a National Emergency Operations Centre in Palikir commenced in January 2012 and is scheduled for completion in November 2012. The early warning communications network will be strengthened with the supply of HF and VHF radios in outer islands of all States with installation to commence in the last quarter of 2012. The support provided for emergency response coordination through improved physical

infrastructure and facilities has been complemented through an ongoing capacity development programme for government officials and other key emergency stakeholders by The Asia Foundation in collaboration with SPC/SOPAC. Approximately 170 FSM personnel will have been trained in a range of courses including Introduction to Disaster Management, Initial Damage Assessment, Emergency Operations Centres and Exercise Management. These courses have provided foundational skills which will enable FSM to optimise the potential provided by the new physical facilities provided through the B Envelope project.

Solomon Islands: Institutionalisation of Disaster Risk Management Training

Building on the successful partnership between the Solomon Islands College of Higher Education (SICHE), the Solomon Islands National Disaster Management Office (NDMO), The Asia Foundation and SPC/SOPAC a four-day version of the Introduction to Disaster Management (IDM) and Initial Damage Assessment (IDA) training courses was developed for delivery to post-secondary training institutions in the Solomon Islands, focusing primarily on nursing schools. The combined course was delivered to students at SICHE in April 2012 and again to students at nursing colleges at the Atoifi Hospital in August 2012 and Munda Hospital in September 2012. For this year 117 nursing students have completed this disaster management training. Significant to note these trainings were delivered by national trainers from the Solomon Islands who have been developed through the Pacific DRM (Training) Program supported by The Asia Foundation in Collaboration with SPC/SOPAC.

Tonga: Lifuka Island – an integrated and multi-disciplinary approach to adaptation and coastal threats in the Ha’apai Group

Coastal vulnerability is a key issue of concern in PICT’s and this frequently revolves around concern over sea level rise and extreme high water / wave events which cause erosion, infrastructure damage and salt water incursion into low lying coastal areas. The low-lying island of Lifuka in the Ha’apai Group, Tonga is presently facing a number of existing and emerging coastal vulnerability issues caused by rapid subsidence (manifesting as rapid sea level rise). Shoreline erosion and groundwater water resources availability is a major concern in this community and the Ocean and Islands Programme (OIP) and Water and Sanitation Programme (WSP) have partnered with the Human Development Programme (HDP) to deliver a comprehensive programme of work characterising the vulnerability and impacts with a view to developing solutions and appropriate adaptation responses.

Funded under the DCCEE (Dept. of Climate Change & Energy Efficiency – Australia), PACCSAP (Pacific Australia Climate Change Science and Adaptation Planning Program) the work recognises the inextricable link between groundwater resources and coastal processes in Pacific Island low-lying environments. Shoreline impacts and groundwater disturbance are vital questions in many coastal low-lying and atoll locations and this study is highly relevant to the assessment of these climate change impacts. It is instructive to note these links are explicit and 6 of OIPs and WSPs planned and present Projects over the next 12 to 36 months which involve integrated coastal/groundwater vulnerability assessments.

In the case of Lifuka, SPC is implementing this project using an integrated and multi-disciplinary approach which recognises the complexity of the issues being faced and added benefits and efficiencies of undertaking such tasks in partnerships. The hydrological work will provide improved understand of the present groundwater resources and impacts of rapid sea level rise (subsidence) on the resource. In turn OIPs work will characterise the vulnerability of the shoreline to erosion and potential inundation, leading to improved information for the groundwater vulnerability assessment and infrastructure damage.

Combined WSP and OIP’s assessment work will provide empirical guidance which can be shared with the Lifuka community to assist in decision making and discussion of adaptation

responses. The HDP is instrumental in this regard as it has collected critical information about the community to assess its adaptation capacity and the community's understanding of impacts and possible responses. All three Programmes will join with Tongan counterparts to deliver the results of these integrated assessments and work with the community to plan an effective adaptation response. Potential solutions and responses will also be "tested" using resource economics (NRE Sector SOPAC Division) to help provide further guidance and understanding of the most appropriate solutions.

Cook Islands, Niue, Kiribati, Tokelau, Tuvalu, Nauru and the Marshall Islands: Maritime Boundaries Agreements Signed

As set out in the 1982 United Nations Convention on the Law of the Sea (UNCLOS) to which all PICs are parties, shared boundary treaties along with the declaration of baselines and maritime zones and limits provides the foundation (geospatial framework) for improved governance, protection, conservation and management of marine resources within national jurisdictions. In August 2012, 7 PICs signed 8 new maritime boundary agreements (Pacific Islands Forum meeting, Cook Islands) bringing state-of-the-art accuracy and legal clarity to the boundary positions of 7 overlapping PIC maritime jurisdictions. This brings the number of regional settled shared boundary treaties from 21, to 28 with approximately 20 more as yet undefined.

The Cook Islands, Niue, Kiribati, Tokelau, Tuvalu, Nauru and the Marshall Islands have been working towards this achievement for some years with the assistance of OIP and our legal/technical partners (Geoscience Australia, the Forum Fisheries Agency, the Commonwealth Secretariat, the Australian Attorney General's Office and UNEP GRID Arundel). This recent success is dependent on the on-going willingness of this partnership to continue to coordinate work and provide multi-disciplinary and sustained support to PICs and is a testament to those involved in this multi-agency collaboration.

It is instructive to learn that some of the technical solutions to support the development of these treaties have been completed for over 15 years; however, no action has been taken to translate this work into a treaty. Key to this recent to this recent success is the strategic and sustained approach formulated by OIP with our key long term partner Geoscience Australia. Previous technical solutions had been developed in relative isolation for PICs (i.e. not with PICs). It follows that ownership and the subsequent desire to use those solutions was almost entirely absent. The present approach has provided the opportunity to build PIC internal maritime boundary capacity (technical and legal) so that each jurisdiction can take full ownership of this process. This also assures excellent in country capacity to brief all relevant sectors of Govt. on why a treaty is being developed, how and the advantages of progressing such work. The country technical teams can also provide important assurances about the accuracy of any treaty solution and independently review any work undertaken. This sustained approach has been developed through a series of progressive maritime boundaries technical workshops (one approximately every 8 months and the 10th will be held in November) which bring together all PICs and considerable technical expertise to progress regional boundaries work.

Given the renewed regional interest in this work following the treaty signing it is important for PICs considering finalising their treaty arrangements to recognise, that a signed treaty is quite literally the 'tip of the iceberg' of work to arrive at this point. The country technical teams, OIP and our partners place huge importance on building the foundations of this work to ensure that boundary solutions are developed which are durable and will service each jurisdiction's interests for the foreseeable future. OIP and the Partnership remain willing to continue this work but success is equally dependent on each country being fully engaged and sustaining their efforts.

Tuvalu, Marshall Islands, Nauru, Tonga and Vanuatu: Ecosanitation Promotion (EcoSan Toilets “on the move”)



Tuvalu Falevatie on Truck

The GEF Pacific IWRM Tuvalu Demonstration aims to demonstrate that improved sanitation technology and practices can protect water resources, marine biodiversity, livelihood, food security and public health. Achieving this has required the Project to embark on a program to change peoples perceptions about how to best deal with sanitation on atolls and then to demonstrate this in practice. After 3 years, a successful public education campaign has resulted in acceptance of the EcoSan toilet (named locally as Falevatie) and the installation of 40 EcoSan toilets in Funafuti. The acceptance of this approach is evident in a quote from the Hon. Willy Telavi, Prime Minister of Tuvalu stating that *"the Government is very supportive of the GEF project, given the shortage of supply of water. That's why we are very supportive of the initiative for people to have access to compost toilets, not only on the outer islands but also in the capital, where they can afford to have these compost toilets. So we can reduce the use of water and the adverse impact of waste water to our ground water table."*

Falevatie's are Tuvaluan designed and have created wide interest in the Pacific, particularly for atolls and can be said to be on "On the Move".

Pisi Seleganiu, Tuvalu's GEF Pacific IWRM Project Manager believes composting toilets are the most appropriate sanitation technology for atoll countries which have scarce water resources and porous soils. A further excerpt from a statement made by the Project manager provides more insight to the local uptake of this toilet.

"Water is such a critical issue in Tuvalu, we recently experienced a serious drought, yet flush toilets that use up to a third of a family's annual water supply is still the norm. The septic systems connected to flush toilets are also poorly constructed and much of the waste inside them seeps out, polluting what little groundwater we have. Septic pollution also finds its way into our lagoons killing the reefs, meaning fishermen have to spend more on fuel to travel further away to catch fish". "These toilets not only save water and prevent pollution but they also produce high quality compost that enriches our poor atoll soils. Many people are using the compost in their gardens to grow fresh fruit and vegetables, which has the added benefit of reducing household costs and increasing food security."

Sharing lessons learned through the network established by the GEF IWRM project, this work was picked up by the Project Manager for the Marshall Islands GEF Pacific IWRM project, who indicated that the Marshall Islands had a lot to learn from Tuvalu's experience and that looking at all options to protect Majuro's water was vital for the long term sustainability of the atoll.

The GEF Pacific IWRM Project has been replicating this design in other Pacific Nations and helping them to construct demonstration EcoSans in Nauru, Marshall Islands, Vanuatu and Tonga.

Nauru: National Policy and Planning Frameworks for Water, Sanitation and Hygiene

Water supply and sanitation issues in Nauru are amongst the most complex and challenging in the world. Frequent and severe droughts, increasing demand for freshwater, and pollution threats to its limited groundwater supply put Nauru in a precarious situation. Added to this is Nauru's reliance on aging infrastructure and energy-intensive desalination, the challenge of securing sustainable funding sources, and coping with the projected impacts of climate change.

These are all issues that the Government of Nauru hopes to overcome through applying an integrated approach to managing its scarce water resources. The IWRM approach has now been given a sound basis through Nauru's endorsement of its first National Water and Sanitation Policy, developed with the support of SOPAC Division and the EU-funded Pacific IWRM Planning Programme. The assistance provided to Nauru was designed in accordance with the specific needs and preferred approaches identified by SOPAC's country counterparts, and planned over a long period of consultation.

Haseldon Buraman, Nauru's National IWRM Coordinator, was instrumental in the development of the policy, and in the subsequent drafting of an implementation plan to turn the policy into action. "The scale of the problem and the issues we need to deal with go beyond traditional infrastructure interventions. Developing the policy has shown that we need to improve governance, capacity and community participation and ensure that water and sanitation issues are tackled by all of government not just the agencies traditionally associated with water resources management," Mr Buraman said. "The fact that we have formed a whole of government Water Technical Committee is testament to just how seriously we in Nauru take this problem."

Nauru's policy addresses 38 priority issues over the next 15 years, covering seven key themes: climate variability and change and water resource vulnerability; water quality and supply; sanitation and environment; demand; governance; capacity; and community awareness and participation. A range of short, medium and long-term activities was selected to address the priority issues under these themes and to fulfill the Government's policy goals and objectives. The agencies responsible for carrying out these activities were identified, along with time lines for completion.

Nauru's water and sanitation challenges remain significant, but this significant step will underpin Nauru's response to these challenges into the future, ensuring that the efforts of many are combined and targeted to achieve the outcomes sought by all.

All Pacific ACP States: Regional Legislative and Regulatory Framework for Deep Sea Minerals

At the 2009 Pacific Island Forum meeting, Leaders agreed a number of key priority areas for progressing the Pacific Plan including: "developing regional and national frameworks to enable the development of the economic potential of marine mineral resources". The Key Result Area 1 of the EU EDF10 Deep Sea Minerals (DSM) in the Pacific Islands Region Project was to develop a Regional Legislative and Regulatory Framework (RLRF) for the sustainable development of deep sea minerals in the Pacific Islands Region.

The DSM Project's inaugural launch meeting (June 2011), was an opportunity to obtain a mandate from the fifteen participating Pacific-ACP States (and the views of numerous other interested parties – from civil society, academia and industry) for the content of the RLRF and subsequently a ToR for the development of the RLRF was agreed. At the Project's second

regional meeting, held jointly with the International Seabed Authority ('ISA') and focussing on environmental management of DSM activities, a legal working group was convened and considered key legal principles to inform the RLRF (a copy of this report has been published as the ISA's Technical Study 10: <http://www.isa.org.jm/files/documents/EN/Pubs/TS10/TS10-Final.pdf>).

The DSM Project prepared the first draft of the RLRF and submitted to a (private sector) international environmental law expert for review, before being circulated for comment in January 2012 to representatives across Pacific-ACP States, as well as: civil society, industry, academia, and other national, regional and international agencies. Comments received were incorporated and the draft further circulated for feedback. This process was also supplemented by the Project's in-country national stakeholder workshops, where the draft RLRF was presented and further comments sought. All together over 300 stakeholders were consulted in the development of the RLRF and this was considered an extremely important component of the document's successes, to ensure that the RLRF should be balanced so as to afford appropriate protection to the marine environment and biodiversity, while not 'over-regulating' to the extent that well-managed and transparent DSM development is not possible.

The RLRF was finalised in July 2012, incorporating comments from all Project countries and some 40+ other substantive contributions from other interested parties and experts. The RLRF was formally launched at the Pacific Islands Forum meeting in Rarotonga where the Leaders recommended that Forum Island Countries consider using the Framework in formulating relevant national policy noting it highlights the need for a precautionary approach and addresses economic, social and environmental aspects to ensure sustainable resource use prevails.

The RLRF is the first document of its kind, setting clear and comprehensive guidance for States in their decision-making about DSM activities, and in developing a robust regulatory regime where DSM activities are to proceed, that is consistent with international obligations, rules and standards.

Regional: Increased capacity in-country for informed decision making in the management of vulnerability and risks

The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) has provided PICs with disaster risk modelling and disaster risk assessment tools. These have been developed with the financial and technical assistance of a number of partner agencies such as the World Bank, ADB, AIR Worldwide, NZ Institute of Geological and Nuclear Sciences and Pacific Disaster Center working with DRP over a 2-year period from 2010.

The tools include the following:

- Regional historical hazard and loss database for major disasters.
- Regional probabilistic hazard models for major hazards: earthquakes (both ground shaking and *tsunami*) and tropical cyclones (wind, storm surge and excess rainfall).
- Regional and national geo-referenced exposure database containing components for buildings and infrastructure, agriculture and population.
- Information on major cash crops and population.
- Country-specific catastrophe risk models and country risk profiles which includes maps showing the geographic distribution of hazards, assets at risk, and potential losses that can be used to prioritise DRM interventions.

The Pacific Risk Information System is the largest collection of geospatial risk information for the Pacific. It contains detailed, country-specific information on assets, population, hazards, and risks; a comprehensive regional historical hazard catalogue (115,000 earthquake and 2,500 tropical cyclone events) and historical loss database for major disasters, as well as country-specific hazard models that simulate earthquakes (both ground shaking and *tsunami*) and tropical cyclones (wind, storm surge, and excess rainfall) and contains risk maps showing the

geographic distribution of potential losses for each country as well as other visualisation products of the risk assessments, which can be accessed through an open-source web-based platform paris.sopac.org.

Phase 3 of the PCRAFI aims to provide further technical assistance to the PICs to refine these disaster risk assessment tools and develop applications to support DRM and Climate Change Adaptation interventions.

Regional: 15 Complete Postgraduate Certificate Course in Integrated Water Resources Management

The scale of water and sanitation issues facing the Pacific is partially linked to a lack of water resources expertise and IWRM awareness, occurring not only at the technological and scientific level, but also in the areas of community engagement approaches, water planning and project management. In the face of climate change and population growth, water professionals can no longer focus on a single aspect of water management. Solving water-related problems requires technical and scientific expertise and greater understanding and integration of environmental, social and political factors, as well as the skills to work effectively with communities.

To help address these knowledge and competency needs SOPAC, with the support of the EU, engaged the *International Water Centre* to design and deliver a Graduate Certificate Programme that provides an integrated perspective on water management. The fully accredited *Postgraduate Certificate in IWRM* included four core modules.

- Project Management
- Science of Water
- Catchment and Aquatic Ecosystem Health; and
- Capacity Building and Community Development

The course was successfully completed by 15 professionals from Pacific Island Countries participating in the IWRM Planning Programme, including 8 women, and 9 staff of country Project Management Units implementing the Pacific IWRM Project

Through planned problem-based activities based on regional case studies, students learned from each other's experiences and formed an effective and ongoing knowledge-sharing network across the region. Feedback from graduates has been overwhelmingly positive, and one of the graduates is now continuing to a Masters degree.

Regional: 12 Countries Benefit from Knowledge Development and Sharing through the GEF Pacific Integrated Water Resources Management (IWRM) Project

The Global Environment Facility (GEF) funded Pacific Integrated Water Resources Management (IWRM) Project was launched in 13 countries in 2009 to protect vital watersheds, manage wastewater and sanitation, assess and protect water resources, and improve water efficiency and safety. After 3 years of implementation, tangible on-ground impacts are now evident. Knowledge exchange is a key objective of all GEF Projects but is often difficult. To increase awareness of national demonstration projects and to inform the region of the significant results achieved each country has produced result notes for the Fourth Regional Steering Committee meeting.

Mr Christian Severin from the GEF Secretariat who attended RSC 4, commended the 12 countries for communicating their results regionally and to the rest of the global portfolio of GEF International Waters projects. He acknowledged that the Results Notes prepared and presented by 12 countries clearly show results are being achieved and provide the types of information and data that are necessary to convince politicians and other stakeholders of the benefits of investing in the critical reforms required for water and sanitation in the Pacific."

The effectiveness of this form for communicating the country projects most significant results is evidenced by them now being featured on the GEF Home page (www.theGEF.org) and as a result featuring globally.

The results notes for participating Members are also available at the GEF Pacific IWRM web page www.pacific-iwrm.org/results (and summarised in the table starting on page 5 of paper SOPAC-2/2.2).
