



Pacific Partnership Initiative on Sustainable Water Management

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Issue: XIX, November 2008

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Welcome to the nineteenth official mail-out of the Pacific Partnership Initiative on Sustainable Water Management. This Quarterly Newsletter provides Water and Sanitation information to Pacific member governments, professionals, NGOs, CBOs, researchers, private sector and counterparts in the donor community who are interested in water sector issues and initiatives.

We would appreciate your assistance in forwarding the newsletter to other colleagues who may be interested in this initiative so that it reaches the widest possible audience.

If you wish to print this newsletter, a PDF version is also available on the new SOPAC Water website:

www.pacificwater.org/pages.cfm/water-governance/pacific-partnership-initiative/e-newsletter-subscription/

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New Report on Sanitation, Hygiene and Drinking - Water in Pacific Island Countries



Efforts by Pacific island countries to improve sanitation, hygiene and drinking water will need to quintuple if the Pacific's Millennium Development Goal targets are to be met. This finding comes from a joint World Health Organization (WHO) and Pacific Islands Applied Geoscience Commission (SOPAC) report released today.

"Converting commitment into action – Sanitation, hygiene and drinking water in the Pacific island countries" provides a concise overview of a sector in need.

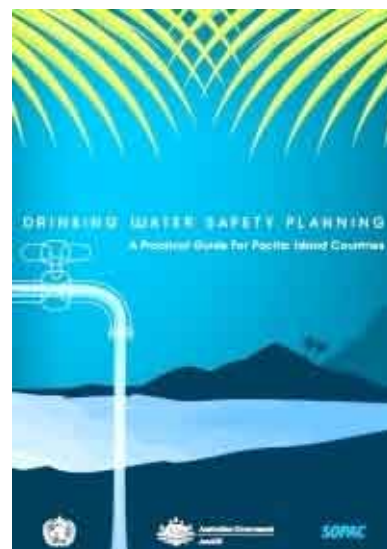
Statistics from the WHO and UNICEF Joint Monitoring Programme used in the report reveal persistent and direct impacts on the populations of 14 developing Pacific island countries from water, sanitation and hygiene related diseases.

As of 2006 only 48% of these populations had access to improved sanitation. Water supplies fare no better, with only 46% having access to improved sources of drinking-water, and just 13% having the 'luxury'

of piped water. According to the report, at least 2,800 deaths each year - the equivalent of nine jumbo jets crashing - are ninety percent attributable to the diarrhoeal diseases which result from poor sanitation, hygiene and drinking water.

"The report makes a strong case for more substantial investments into the water and sanitation sector" according to Ms Cristelle Pratt, Director of SOPAC. The 57-page report is being launched today in Melbourne, Australia where government and sector agencies from Asia and the Pacific are attending the AusAID and World Vision 'Sanitation and Water Conference 2008'.

Dr Chen Ken, Representative for the WHO South Pacific Office in Suva, agreed there has been considerable progress in recent years, but he emphasized "Pacific countries and partners could do much more to support such basic needs". Dr Chen Ken said useful cooperation frameworks and partnerships among governments, communities and sector players have been established. However, according to the report, compared to the period from 1990 to 2006, five times the effort will be needed from donors, supporting partners and governments alike to halve the number of households without safe sanitation and drinking water by 2015. The report was prepared with funding from AusAID.



A Pacific Drinking Water Safety Planning Guide is also being launched today by SOPAC and WHO under a joint programme funded by Australia and technically supported by New Zealand. The guide, intended for use by health and water sector partners, was developed through two years of country-level activities to improve urban and rural water supply systems in Pacific island countries.

For further information on the Launch of the Pacific Drinking Water Safety Planning Guide please contact:

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Tuvalu prepares for Drought

The European Union has provided Tuvalu with funds totalling €700,000 (A\$1.4 million) to supply households on Funafuti with additional rainwater storage and distribution. This project is part of a €9.2 million (A\$18.4 million) Multi-Country Disaster Risk Reduction Project which is implemented in eight countries with the assistance of the Pacific Islands Applied Geoscience Commission (SOPAC). The project uses residual European Development Fund (EDF) 9 funds under the B Envelope funding mechanism.

In a small ceremony held today on Funafuti, EU representative, Mr. Malcolm Ponton, said that “the project was vital for the country because of the increased incidence of drought and the lack of groundwater resources on Funafuti. The additional 3 million litres storage capacity provided by the project will help the country in times of need”.

SOPAC Director, Cristelle Pratt says “the focus of the project in Tuvalu is to improve water security and sanitation services and addresses one of the key priorities of the government as most of the population are dependent on rainwater harvesting”. She further states that “the Project will improve storage capacity and will contribute towards better health, alleviate poverty and mitigate against vulnerability to drought”.

Approximately 150 ten thousand litre water tanks have been supplied by Rotomould (Tuvalu) Ltd so far with installation underway with the assistance of the Ministry of Public Works and Utilities.

Director of Public Works, Mr. Ampelosa Tehulu states that the project provides for community self sufficiency and encourages ownership thus reducing the need for relying on government to provide water from their reserves”.

The project will also supply a water tanker truck to the government to assist in the distribution of water.

The Project, Cristelle says, “will greatly benefit the people of Tuvalu which compliments the policy work and other interventions being undertaken in the water sector through projects such as the EU funded Integrated Water Resources Management National Planning Programme and Pacific Hydrological Climate Observing System”.

“Mr. Ponton added that the EU is in the process of preparing a further programme of support to the water sector in Tuvalu amounting to €4.4 million”.

For more information on the story above, please contact:

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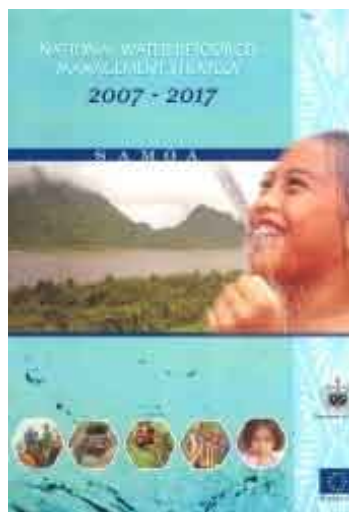


SOPAC





Samoa's Dynamic Water Sector - 1st Annual Joint Sector Review



Under the Water Sector Support Programme the Government of Samoa has been working to improve the quality of public health through improved water services and sustainable water resource management. Implemented through four agencies in Samoa, and running from 2005 to 2012 the €20m programme has already made significant progress.

At the 1st Annual Joint Sector Review meeting stakeholders from Government, community organisations, donors and CROP Agencies were invited to review progress against the six objectives of the Water Sector Support Programme facilitated by the Water Sector Management Unit. The meeting provided an opportunity for a review of current and future projects within the water sector including the ADB funded Samoa Sanitation and Drainage Project, Pacific IWRM and Pacific HYCOS funded by the EU and the Global Environment Facility, and the Water Quality Monitoring Programme supported by NZAID and the New Zealand Government Agencies Fund.

Participants were able to provide recommendations on the water sector performance indicators in order to keep monitoring to a realistic, achievable, and cost-effective level. Significant progress has been made in Samoa regarding development of water management, with the launch earlier this year of the Water for Life document to guide the medium term development of the water sector in Samoa. The challenge now is to put the plan into action and reap the benefits of improved water management for all Samoans.

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Watershed Management for Ecosystem Rehabilitation in Palau



'Improving ecosystem stability is a key element for this project to address' said Metiek Ngirchechol, Laboratory Supervisor from the Palau Environment Quality Protection Board. The Ngerikiil Watershed Restoration project will be funded by the Global Environment Facility as part of the Pacific Integrated Water Resources Management Programme.

The Ngerikiil Watershed in the State of Airai on the island of Babeldaob contains the water source for both Airai and Koror, serving 78% of the population of Palau. Through a previous USDA Natural Resources Conservation Services assessment, five critical resource concerns for the watershed were raised: (1) soil erosion and sedimentation in the river, (2) nutrient, fertilizer, and pesticide pollution from agriculture, (3) solid waste disposal, (4) invasive species, and (5) wildlife habitat loss.





Given the importance of the watershed to the livelihoods of a large percentage of the population, improved water quality is a high priority for local and national government. The main source of pollution is sedimentation caused by poor erosion controls, loss of riparian buffers, and poor land-use practices. Sedimentation is also an issue for coastal areas, where river based sediment has covered reefs killing live coral. Heavy rainfalls in the watersheds cause immediate sediment loading into the rivers. This affects coral reefs and seagrass beds on the coast as well as impacting the treatment of public water supply systems.

Increased sedimentation onto reefs has a negative impact on biodiversity. It leads to coral death and decrease in fish numbers, therefore indirectly impacting subsistence fishing. Also, increasing sedimentation in the rivers increases the need to use more chemicals to reduce turbidity levels to drinking water standards and also increases the use of disinfectants to ensure safe drinking water. This translates to an increase in expenditure on chemical supplies. Simple filtration systems do not remove enough turbidity and this reduces the potability of reticulated water from such systems. In such instances, human health is at risk if public water systems are the main drinking water sources.

Based on these identified and very visual impacts the GEF funded project aims to use an Integrated Water Resource Management approach to tackle some of these problems. This will include:

1. **Improving surface water quality** – through surveying pollutant sources, riparian native species re-vegetation, and pollution monitoring
2. **Drainage mitigation** – storm water assessment and training of staff, analysis of road drainage as pollution source and identification of mitigation approaches
3. **Improvement of Biodiversity/Bio indicators** – through monitoring invertebrates and other bio indicators to assess watercourse health
4. **Policy Development and Awareness Raising** – through possibly Payment for Ecosystem services trails, improving socio-economic understanding of the benefits of the watershed to the people of Airaii and Koror, and development of a water safety plan for the current reticulated system.

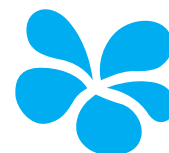


'Our aim is to be moving in the right direction with restoring the watershed and in reducing negative impacts. If we can reduce pollution problems now, and improve the situation in the future, it not only brings both biodiversity and ecosystem benefits to Palau, but also improves the health of the people, and reduces our costs', said Metiek Ngirchechol.

Lessons learned by each country will be replicated to other areas in the future to build on positive success and shared across the Pacific region with the other 13 countries involved in the Pacific IWRM programme.

For further information on this project, please contact:

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Measuring River Flows for Ngalimbu Hydroelectric scheme, Solomon Islands

The Solomon Islands among other Pacific Island Countries (PIC's) has felt the significant effect in the capital city of Honiara of the cost electricity generation through the substantial price increase of diesel fuel thereby lifting severely the price of generation and the cost to the consumers. The main island of Guadalcanal however has abundant water resources which can be potentially developed for hydro generation of sustainable electrical energy for the island as well as having irrigation potential. The Ngalimbu River in the north east of the island has had identified potential for many years to provide up to 20 megawatts of energy depending on the type of scheme adopted, storage or run-of-river.



The World Bank has recognised this as a priority for Guadalcanal's development and is assisting in the early planning for project advancement and development. As with many water related projects in the PIC's, there is a general absence of design data to enable assessment of water availability for firm electric demand, with respect to low flows, flow durations and floods, all necessary for sound design and economic planning of the scheme. Without measured data, options for estimation of these flows are by transposition of data from another catchment if data exists and or mathematical modelling of the catchment using catchment characteristics and regional rainfall data and or design curves.

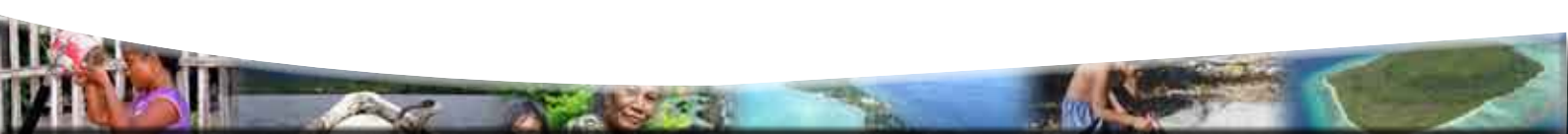
The Pacific Hycos Project www.pacific-hycos.org is assisting the Hydrology Unit of the Department of Mines and Energy with provision of river flow measuring equipment, technology and capacity development to reinstall a station on the Ngalimbu River at a site operated for a short period in the 1970's. Likewise assistance is being given in locating any historic data that exists for this site, processing of this so it can be considered in final project design.

Whilst the type of hydrological data required for development of hydro electric scheme such as this takes many years of robust field data collection and will not provide immediate design data as such, it will assist in some calibration data for existing flow modelling and in time will provide long term datasets for scheme operation, perhaps expansion and catchment management purposes. This installation to be completed in early 2009 will follow the successful reinstallation of the Lungga River flow station close to Honiara earlier this year, also undertaken with Pacific HYCOS assistance.

For further information on the Ngalimbu Hydroelectric scheme in Solomon Islands, please contact:

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SOPAC Secretariat
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Cross Connection Control and Back Flow Prevention in American Samoa



Recent enforcement by the American Samoa Environmental Protection Agency (AS-EPA) for required protection of the American Samoa Power Authority (ASPA) water system from cross contamination has created a large need for backflow prevention requirements on the water system. The administration of a Cross Connection Control (CCC) and Back Flow Prevention (BFP) program by ASPA is required by the American Samoa Administrative Code (ASAC). The program is in its initial stage, but will significantly increase protection of the public water systems from cross connections and low pressure back-siphonage while also increasing consumer confidence in ASPA's potable water product.

A cross connection in a water system is a physical connection of non-potable water or other substances that may contaminate water provided by the public water system through backflow. When there is a directional flow reversal in a distribution system which causes mixing of potable water and other substances through a drop in pressure, back-siphonage or a combination of both, it creates dangerous conditions and may cause contamination of a water system. A mechanical device used to prevent backflow is called a Back Flow Prevention Assembly.

Although long-required by the ASAC 25.04, the CCC and BFP program has just recently been emphasized by AS-EPA as growing public water demands create low line pressures and increase public health risks. ASPA is currently working on standards of operation for the CCC and BFP program while requiring all new commercial water service connections to be equipped with AS-EPA approved backflow prevention assemblies such as double check and reduced pressure devices. ASPA and AS-EPA have jointly conducted a three-day CCC and BFP class which was attended by representatives from numerous other public agencies. A principal purpose of the training was to generate awareness and support for the success of the program.

Results for the CCC and BFP program are already evident. Recent installations of back flow prevention devices across the island and the training of key ASPA staff to identify potential cross connections are indicative of ASPA's commitment to the program. Installation of approved reduced pressure back flow prevention devices at locations such as the farmers market, the VA medical clinic, the LBJ Tropical Medical Center and a portable assembly for usage on the Port Authority shore-to-ship water transfer hydrants are just a few examples of local CCC and BFP progress.

To create more consumer awareness of the program ASPA and AS-EPA will continue to enforce the need for back flow prevention by education of consumers and continued training for cross connection control specialists and back flow assembly testers within the ranks of ASPA. Protection of the public water system is the ultimate goal of the program.

For further information on Cross Connection Control, please contact:

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American Samoa Environmental Protection Agency
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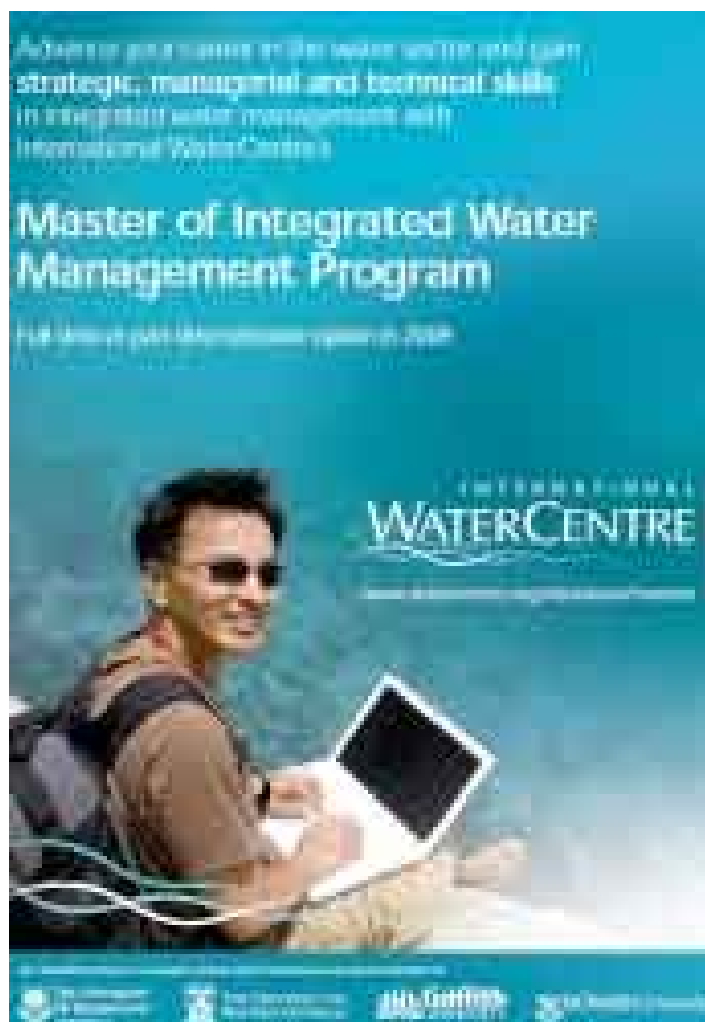
Master of Integrated Water Management program

International WaterCentre is pleased to announce that the Master of Integrated Water Management will be available via part time, distance education starting Semester 1, 2009.

This option has been developed for students within Australia as a convenient way to study and further their career while still working.

The Master of Integrated Water Management Program aims to build the capacity of future leaders in water management. It draws on the international expertise from our member universities (The University of Queensland, Griffith University, Monash University and the University of Western Australia) in teaching and research across a wide breadth of disciplines, taking a multi-disciplinary and whole-of-water cycle approach.

The part-time course will run over a three year period, with students undertaking two course modules and associated problem based learning activities per semester for the first two years.



The final year will be devoted to an individual research project where students can specialise in a particular field of water management.

Most of the course will be conducted on-line; however, at the beginning of each of the first four semesters students will be required to attend a short residential period to participate in field trips and workshops together with full-time students.

Semester 1 starts March 2, 2009. Part time students will be required to attend a residential period from March 2 - 6. This period will include program orientation, intensive workshops and a field trip to North Stradbroke Island. Semester 2 field trip will take place from August 3 -14.

Students enroll at The University of Queensland and upon graduation receive a co-badged qualification from all four member universities.

Applications for Semester 1, 2009 should be submitted to The University of Queensland by February 16, 2009.

Graduates of the program will be qualified to apply for high-level management positions in the public, private and NGO sectors.

International WaterCentre, the business centre for building international capacity for integrated water management, is a unique collaboration between four leading Australian universities.

Find out more about the program, download your application or contact International WaterCentre with your questions, please visit: www.watercentre.org/education/distancedelivery call 07 3123 7766 or email admin@watercentre.org





Protecting the Laura Groundwater Lens, Republic of the Marshall Islands

The Global Environment Facility will support the development of a Laura Integrated Water Resource Management and Development Plan for this most fragile of groundwater reserves in the Republic of the Marshall Islands.

Majuro Atoll, the capital atoll of the Republic of the Marshall Islands (RMI), is one of the most densely populated places in the world. Consequently, there are major constraints affecting water resource management. Majuro is home to 30,000 residents on an area of land only 3.75 miles², with a population density of approximately 8000 people per mile².

Laura lies on the western fringe of Majuro Atoll and is connected to the main urban centre of Delap-Uliga-Dirita (DUD) by a 30 mile strip of land, often no more than 400m wide in places. The thin coastal strip surrounds a lagoon 114 miles² in area, of which 97% is seawater. Land and freshwater resources are therefore finite and extremely scarce.

The land area of Laura is Majuro's largest groundwater resource and supplies the entire population of Laura and supplements the whole Majuro water supply system for its 30,000 residents. Rainwater is the primary source of freshwater supply in Majuro which is harvested in reservoirs using the airport runway as a catchment area. The airport catchment water is supplemented by the groundwater pumped from seven wells in Laura to the reservoirs. In frequent periods of drought, the reservoirs often run dry resulting in a major dependence on emergency back up supply from the Laura freshwater lens.

Traditionally known as 'Laura Village', Laura's estimated population for 2006 was 3,000 (>10% of Majuro Atoll's total population). Laura has rapidly moved on from its traditional setting of a 'village' to rapid residential and small commercial development, including recent growth in small-scale commercial agriculture. However, the urbanisation of Laura is having unprecedented adverse impacts on the groundwater lens, lagoon and surrounding marine environment.



In Majuro, where small communities depend on community-based or individual water catchments, people have developed a significant understanding of the value of freshwater supply, making water consumption per capita very low in Laura as people strive to keep their water source sustainable and protected. Despite this low consumption, the limited supply available is heavily threatened and requires immediate protection.

Under the GEF funded Pacific Integrated Water Resources Management Project (Pacific IWRM) a Laura Integrated Water Resource Management and Development Plan will be developed to protect the groundwater resource at Laura through a variety of activities steered by the Laura Water Lens Protection Coordinating Committee (LWLPCC). The LWLPCC is a recently established interagency committee consisting

of members of National Government, Local Council, and Landowners, responsible for the development and ultimate management and monitoring of the Laura Lens Management and Development Plan.

John Bungitak, General Manager of the Environmental Protection Agency has been involved in formulating the project on behalf of the Government, 'What we are trying to do is develop a working plan, a tool for stakeholders to investigate, assess, and understand the pollution issues affecting Laura Lens, so that we



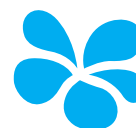


can raise awareness and look at options to keep the groundwater safe. With our growing population and climate variability we have to prepare ourselves for future situations’.

The project is due to start in January 2009 and will run for five years.

For further information on this project, please contact:

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Bathymetry and water supply economic studies in Niue



Two economic studies are currently being undertaken in Niue by the SOPAC Resource Economics Team. Each study will produce a technical report intended for national and regional stakeholders, as well as a summary brief which can be used as a media release for wider circulation.

The first economic study examines the economic value of bathymetry maps which were compiled by SOPAC staff for Niue’s seabed in 2005. This study will examine how the maps have been and could be used to generate economic benefits. For example, the Fisheries Department in Niue has been using the bathymetry data to select sites for the placement of new fish aggregation devices (FADs). Other potential ways in which the bathymetry data could be beneficial would be by providing information for new mooring sites, improved marine resource management and tourism opportunities. The high-resolution maps cover Niue’s entire Exclusive Economic Zone (EEZ) and are freely available from SOPAC.

The second economic study is a least-cost analysis of Niue’s water supply options. Currently, water is pumped from the groundwater lens using fossil fuels. There is some interest in developing either renewable energy options for groundwater pumping or installing rainwater tanks. The economic analysis will identify which is most feasible, given Niue’s water demand and access to alternative supply options. The issue of cost recovery will also be investigated in the same analysis.

For more information on the the Economic Case Studies in Niue, please contact:

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Occurrence and Impact of Tropical Cyclones in the South Pacific



Geoff Mackley

Tropical cyclones are the major cause of natural destruction in the tropical South Pacific, directly or indirectly affecting the economy of almost every country in the region. The impact, in many cases, is far reaching and it may take people several decades to recover.

On average about 9 tropical cyclones occur annually in the South Pacific, a third of which attain mature (hurricane) intensity or stage. The number can be much higher during a strong El Nino or La Nina event. The cyclones usually form close to the Equator (within 15° Latitude) in the South Pacific Convergence Zone, or in the monsoon trough that occasionally extends eastwards into the Pacific over Papua New Guinea and Solomon Islands. Typical areas of formation are in the Coral Sea that is south of Solomon Islands, or in the area between Solomon Islands and Tuvalu.

However, during El Nino periods, the cyclone formation area can stretch far eastward to French Polynesia, and beyond. The average movement is south, or southeast, into higher latitudes; however the movement can be very erratic due to the influence of the sub-tropical jet stream that is usually much closer to the Equator in this region than elsewhere. It is for this reason that the South Pacific is regarded as the most difficult of the six cyclone basins of the world in terms of cyclone track and intensity forecasting.

On average, Fiji is affected by some 10 to 15 tropical cyclones per decade, of which about 3 to 4 cause major damage. In most parts of Fiji individual localities experience the nearby passage of a tropical cyclone some three to four times per decade. Vanuatu and New Caledonia may be affected slightly more often than Fiji, while other countries, especially those falling east of the International Dateline, are affected significantly less often. In fact, cyclones rarely form far east of the Dateline except during El Nino periods when a warm pool of waters extends to this area providing ideal conditions for cyclogenesis. As a result Cook Islands and French Polynesia have a higher chance of being threatened by a cyclone during an El Nino episode than at other times.

The effect caused by many of the cyclones in the past has been severe with far reaching consequences. For example, four cyclones affected Fiji between January and March 1985, with two, namely Eric and Nigel, having struck within 48 hours of each other and caused damage exceeding \$US30 million. Then Kina struck in early 1993 causing the worst flooding in over 50 years and the highest ever damage of over \$US120 million. Ofa struck Western Samoa with a lapse of some 20 years causing estimated damage of some \$US120 million. Val came a year later attributing to nearly \$US200 million damage. Namu hit Solomon Island outside the usual cyclone season in 1986, accounting for the loss of over 100 human lives. Bola struck Port Vila, Vanuatu twice in 1988, as it made a double loop over the country, before speeding south to New Zealand where it caused the worst flooding as an extra-tropical system.



In several cases, the experiences and sufferings have been once in a lifetime, and the damage well beyond repair.

❁ The Fiji Meteorological Service operates the newest of the five Regional Specialised Meteorological Centres for tropical cyclones under the World Weather Watch Programme of the World Meteorological Organization. RSMC, Nadi acts as the cyclone advisory centre for the South Pacific, and also provides warning and forecast services for some ten countries of the region (American Samoa, Cook Islands, Fiji, Futuna, Kiribati, Niue, Tokelau, Tonga, Tuvalu, Wallis, and Western Samoa.)

For further information on Tropical Cyclone Season, please contact:

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South Pacific Tropical Cyclone Season Outlook

Highlights: 2008/09 Tropical Cyclone Season is to commence under "Neutral" conditions (i.e neither La Niña or El Niño conditions). Near average cyclone activity is likely for most tropical South Pacific countries including Fiji. This means that two or three cyclones are predicted to pass through Fiji's Waters (EEZ) this season with at least one of them directly affecting land areas. Rainfall across most of the country is favoured to be average or above average at least until the end of January 2009. Therefore the chances of flooding associated with tropical disturbances e.g depressions and cyclones are higher than usual.

The South Pacific Tropical Cyclone (TC) Season formally begins on November 1st and ends on April 30th. Though a TC can also develop outside this period, such occurrence is rare under Neutral conditions. The average* number of tropical cyclones occurring in the whole Southwest Pacific region per season is around nine, with majority of them occurring within the RSMC Nadi-TCC area of responsibility (0°-25°S and 160°E-120°W). About half the total number of cyclones may reach hurricane intensity (Category 3 at least) with potential to cause severe destruction.



In seasons similar to the upcoming one, two to three TCs on average pass through each of the regions covering Vanuatu, New Caledonia, Fiji and Tonga. The majority of TCs pass through Vanuatu and New Caledonia regions. Specifically for Fiji, one to two cyclones on average directly affect land areas. Reduced risk of cyclone activity is likely in Tuvalu, Northern Cook Islands and French Polynesia regions while elsewhere the risk is expected to be average.

The overall state of the climate in the Pacific Basin is currently Neutral. This condition is expected to remain almost throughout the Cyclone Season. Global, regional and local rainfall prediction models favour average or above average rainfall across most parts of Fiji until January 2009, with variable pattern after that. Taking into consideration the tropical cyclone and rainfall predictions, the

likelihood of flooding during most of the Wet Season will be higher than usual. Sea surface and air temperatures in the Fiji region are also expected to be average or above average. In other words, at least the first half of the Cyclone Season is likely to be a hotter than usual and normal to wetter than normal.

People should therefore be prepared for at least one severe tropical cyclone and several flash flooding incidences in the upcoming Cyclone Season.

🌸 Average for 1970/71 to 2007/08 TC seasons.

For further information on Tropical Cyclone Season, please contact:

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A Life in Science - Tuvalu's Students Shine at STAR

Many students from senior primary and secondary schools around Funafuti were given a special opportunity to engage with various scientists and natural resource managers at this year's Science, Technology and Resources Network (STAR) Meeting, which preceded the 37th SOPAC Annual Session held in Tuvalu, Funafuti from 21-30 October 2008.

This year's STAR theme "Environmental Change and Oceanic Islands Especially with Respect to Managing Water Resources and Sanitation on Atolls" brought together a modest group of the region's scientists, SOPAC staff and Pacific Island National Representatives and other interested partners for an opportunity to discuss and explore science based options to tackle environmental change.

Given the focus of the theme, several presentations were delivered in the area of water and sanitation including groundwater monitoring in atoll environments, monitoring the effects of the mineral water abstraction on groundwater systems in Fiji, and integrated water resources management approaches undertaken in the region to name a few.

One of the highlights of this year's STAR session however, was the student programme which provided an interactive space for several STAR delegates and SOPAC staff to share information and experiences with school students in the areas of energy, disaster management, water and sanitation and coastal management.

Students navigated their way through Google earth, carried out water quality testing using the hydrogen sulphide presence and absence tests on nearby supplies, and explored the nearby beach in an effort to understand coastal processes better.

The student programme at STAR provided an opportunity to expose students to the use of science in managing various resources. It was also a bid by STAR delegates to encourage more students to study sciences in their secondary and tertiary level education in an effort to produce future regional scientists and resource managers.

For further information on Integrated Water Resources Management, please visit:
www.pacificwater.org/pages.cfm/water-governance/integrated-water-resource-management/
www.iwcam.org/

or contact:

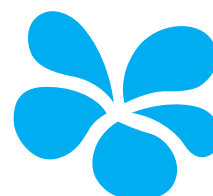
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SOPAC





Flood Forecasting and Warning for the Rewa River, Fiji Islands

The high rainfall, steep topography and relatively large catchments combined with intensive agricultural use of lowlands by village communities have made Fiji susceptible to flood disasters over the years. Inland flooding is currently the most frequent and damaging hazard to communities in Fiji with almost one event each year on average (SOPAC 2005). With an estimated annual mean of 10 casualties and around F\$ 20 million total damage, floods are a serious draw back to Fiji's socio-economic development. Apart from damage to infrastructure and agriculture and homes, there is considerable disruption to transport and inland communications. Though many events are not associated with unusual meteorological extreme events they still cause significant damage. Again, regional flooding in 2006 and 2007 has caused serious damages and deaths in several parts of Fiji.



The Hydrology Section of the Ministry of Local Government, Urban Development and Public Utilities, (MLGUDPU) through its hydrological field teams has operated a flood warning system on the Rewa River since 1986 in order to deliver advanced warning of significant flooding; the system fell into disrepair in the early 2000's. The system is now being upgraded under Pacific HYCOS www.pacific-hycos.org funding which will upgrade the river (6) and rainfall (5) stations with new generation sensing and data transmission equipment. Assistance is also being given by Pacific HYCOS in capacity development in order to up skill field teams and office staff in the operation of such systems and how to undertake the necessary regular field measurements, operation and maintenance works in order to sustain such systems. Field

data collected by field teams during times of flooding is critical in allowing a measure of flood flows and return periods, essential for flood estimates and flood model development thereby supporting mitigation measures and community risk programs.

The Rewa Catchment is Fiji's largest River system with a catchment area of 2960 km² draining approximately 30% of the main island of Viti Levu, it has a potentially effected population of 5,744 urban and 15,873 peri-urban with a total watershed population of 196,000 including the delta

The overall goal of the project is to give more accurate flood warning for communities on the Rewa flood plain through an upgraded and effective flood warning system and also to collect long term catchment runoff and related information. This is part of an ongoing integrated flood management initiative of Fiji aiming to provide warning services to population centres of four major watersheds in Viti Levu, namely the Rewa, Navua, Ba and Nadi river basins.

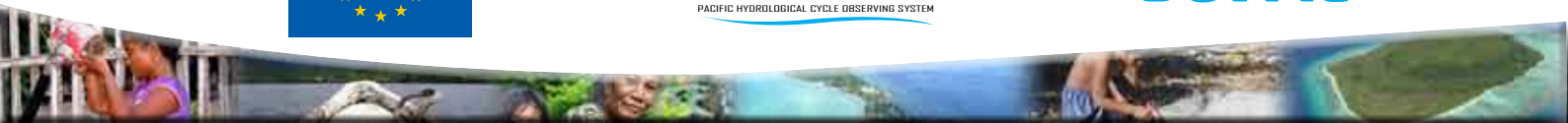


The system will be connected to a base station at (MLGUDPU) and a secondary base at the Nadi Fiji Meteorology Service Office with 24/7 attendance. According to predefined flood levels, alerts and warnings will be provided to emergency agencies and the general public. For increased lead times, flood levels shall be predicted using recorded and forecasted rainfall and river flow data through a calibrated flood model. The system is being installed under international contract and will be commissioned early in 2009.

For further information on Flood Forecasting and Warning, please contact:

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Ministry of Local Government
Department of Public Utility
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Llyod Smith
HYCOS Project Coordinator
SOPAC Secretariat
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Using GIS in Rainwater Harvesting to improve health on Funafuti, Tuvalu

Funafuti the capital, of Tuvalu, with a land area of 1.4sq kms relies almost exclusively on the collection of rainwater for the freshwater needs of its population of around 5,000. The coarse coral sands that dominant the geology of Funafuti, and the small extents of the islet, being only 20 - 400m wide, means that the potential for fresh groundwater is not available.

Recent initiatives through AusAID and the European Union will see the delivery of over 600, 10,000L rainwater storages to houses and government residences. A survey in October 2007 of rainwater storages in Funafuti, was undertaken by Pacific HYCOS project at SOPAC, to both identify the existing volume of storage available and to assist current and future programs in the implementation of rainwater collection and storage interventions.



Using satellite imagery, from 2006, with 60cm resolution, all roofs were digitised forming the basis for a GIS and for further survey work. Some 770 roofs were followed up with surveys, using teams from PWD and SOPAC. Information on roof and guttering condition, size of storages, use of water, and supporting information such as number of people living in the house, access to alternate water supplies and wastewater disposal was recorded. This was then further characterised into community, government, residential and commercial collection and storage systems.

Whilst government transports water from strategic supplies to residences, the survey identified that less than 15% of all available rainwater storage is owned by government, suggesting limited capacity for government to support the population during

extended dry periods. Private residences account for about 70% of all available storage volume, and that less than 65% of all roofs have sufficient guttering to capture all runoff, and that about 50% of all guttering inspected is in need of repair or replacement.

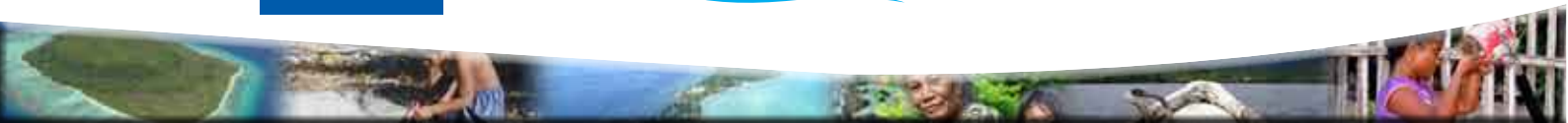
It is hoped that this GIS and database will assist to shape interventions into increasing drought resilience in Funafuti. There is potential to identify houses of high water demands, and also link water quality with water borne disease outbreak.

A joint study is proposed with Tuvalu Ministry of Health, Tuvalu PWD, Fiji School of Medicine, SOPAC, to look at providing statistics on health in particular diarrhea, sanitation practices, and water sources and storage, and handling practices. The study is aiming to survey every of the 650 households in Funafuti on a monthly basis including testing the drinking water for bacteria, using the WHO H2S kits with some quantitative testing by MoH using the Colilert bacteriological sampling technique, recently introduced under Pacific HYCOS project. The outcome of the survey is to evaluate what the impact interventions on water supply and sanitation can have on community health.

For further information on Rainwater Harvesting project in Funafuti, please contact:

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Director of Works
Public Works Department
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Peter Sinclair
HYCOS Project Adviser
SOPAC Secretariat
Email: peter@sopac.org





Retirement of a Drinking Water Safety Planning Champion, Dr Michael Taylor

Following the retirement of Dr Michael Taylor, Senior Advisor at the New Zealand Ministry of Health we would, on behalf of our Pacific partners, like to express sincere thanks to Michael for his support through introducing the concept of Drinking Water Safety Planning in partnership with SOPAC and WHO.

The success of this new approach was only possible due to the dedication and perseverance of Dr Michael Taylor to establish partnerships between New Zealand and Pacific island countries and likewise between water and health specialists and practitioners.

Michael brought a wealth of experience on drinking water safety planning to the Pacific region and his enthusiasm has provided countries involved as well as SOPAC and WHO with great motivation to improve drinking water safety.

It has been a pleasure and privilege to work with Michael and we wish him good health and much happiness during his retirement.

For further information on Drinking Water Safety Planning please contact:

Tasleem Hasan
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SOPAC

Communications in the spotlight – Pacific Islands to work strategically towards changing attitudes and behaviours for better water resources management



Pacific Island Countries are highlighting communications and awareness as a cross-cutting priority issue for improving water resources management. At an Integrated Water Resources Management (IWRM) planning meeting held in Niue in July, delegates from Pacific Island Governments asked for support to develop strategic communications approaches to help achieve national objectives for water resources management.

Communications between different sectors of government needs to improve in order to avoid duplication of effort, counteractive approaches and gaps in water management. A lack of communication between national and local level management has also led to disparity between national policy and on-the-ground implementation.

At the IWRM Planning meeting many participants were concerned that the communities and the governments they represented had not yet understood how important it is to work across the boundaries of different sectors of government, the community and business to address water issues.





Due to the all encompassing nature of water we all need to get involved and informed about how best use and protect water sources. Communications and awareness raising among the public, decisions makers, civil servants and other key stakeholders on basic approaches to water resources management, is a cost effective way of changing attitudes and behaviours for better water resources management. It is also an essential tool to secure the necessary political will to commit resources to action.

Communications and awareness raising is nothing new to water management in the region, but has often been patchy or limited to press releases, disparate events or initiatives. Communication efforts cost time and resources, and it is therefore important to take a strategic approach that ensures that the way of communicating is effective and has the desired effect on target groups. Methods for communicating need to be planned, tested, evaluated and adapted to be effective, just like other activities in a project or process management cycle.

In response to the request for help, over the next two years the Pacific IWRM programme will be supporting Pacific Islands Countries to build capacity and develop communications strategies to support improved intersectoral coordination and stakeholder involvement in water resources management.

For further information on Integrated Water Resources Management, please visit:
www.pacificwater.org/pages.cfm/water-governance/integrated-water-resource-management/
www.iwcam.org/

or contact:

Rhonda Bower, James Dalton, Ulrika Gunnartz
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Integrated Water Resource Management
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Supporting Integrated Water Resources Management in the Pacific



Following on from the Integrated Water Resource Management meeting in Niue (18-22 July) the Pacific IWRM Programme is in the process of recruiting staff for the GEF funded Project Coordination Unit (PCU) to support the 14 countries involved in the project. The PCU will be based in SOPAC in Suva, Fiji.

Andre Siohane, Manager of the Water Supply Division in the Niue Public Works Department, and also a member of the GEF Project Steering Committee was elected by the Steering committee to sit on the interview panel. "We are looking for people who can fulfil the role of advising us technically on water and environmental management issues, but who can also support us in dealing with our own unique way of doing things. Fourteen different countries in one project is a challenge, and we all





do things differently and have different processes to follow – we need professional people to support us and trust us to learn from each other”.

The Project Coordination Unit will be in place for early January 2009. More information on the PCU will appear in future newsletters. Countries across the region are already recruiting for national level project managers to implement the GEF funded Demonstration Projects. The Republic of the Marshall Islands, Tonga, Niue, and Fiji have recently started this national level recruitment process.

Recently developed guidelines on establishing National Water APEX Bodies and supporting existing National Water Committees will be sent to countries to help them in strengthening national water governance. A series of toolboxes are currently under development which provide resources, information and case studies for countries to build on in applying inter-sectoral water management approaches. This IWRM Resource Centre will be accessed through SOPAC in Suva, and the Pacific Water website.

For further information on Integrated Water Resources Management please visit:
www.pacificwater.org/pages.cfm/water-governance/integrated-water-resource-management/

or contact:

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Water Supply Division - Public Works Department
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Email: waterworks@mail.gov.nu

Rhonda Bower, James Dalton, Ulrika Gunnartz
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SOPAC



Global Handwashing Day – 15 October 2008

Soap 'Em Up! Keep 'Em Clean! – Its Global Handwashing Day!



Global Handwashing Day was launched at Samabula Primary School on October 15, 2008 by a prominent sportswoman in Fiji Makelesi Bulikiobo-Batimala. The launch was coordinated by United Nations Children's Fund (UNICEF) and Live & Learn Environmental Education (LLEE). Other stakeholders from the WASH coalition were also present to help launch the day which include World Health Organisation, SOPAC, Fiji Red Cross and the Foundations of the People of South Pacific - International.

The purpose of the celebration was not only to launch global handwashing day in Fiji but to make people aware of the importance of handwashing. Students of Samabula Primary School participated in activities that highlighted the importance of handwashing through role plays, speeches, songs and demonstration of proper handwashing.





The activities highlighted how people all over the world wash their hands with soap and water. And the different time when it's required to wash hands for instance after using the toilet, after cleaning a child's bottom and before and after handling food (include eating, cooking and feeding babies).

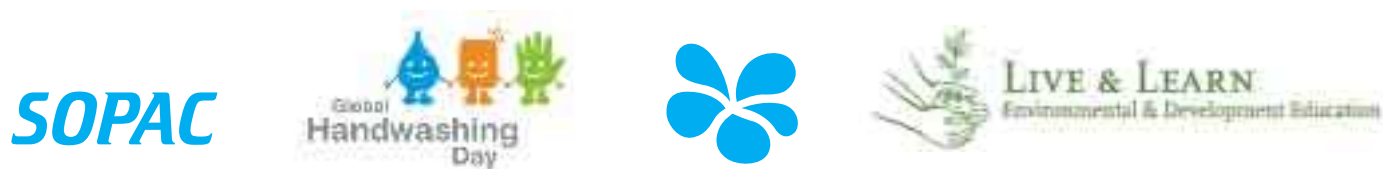
Through Live & Learn the promotion of handwashing will be promoted in schools and communities.

For further information on Global Handwashing Day, please visit: www.globalhandwashingday.org/

or contact:

Iva Bakaniceva
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 **New Water Website for the Pacific - Check out www.pacificwater.org**

We are very happy and proud to introduce you to this new interactive information portal on [water, sanitation and hygiene for the Pacific](#), which will help Pacific Island Countries, the Pacific Water Partnership and SOPAC to share information and news on some of the most important development issues in the Pacific today.


You can find information on the website about all SOPAC initiatives, programmes and projects on water, sanitation and hygiene, by three main themes:

 **Water Resources Management:** the Pacific Hydrological Cycle Observing System (HYCOS), drinking Water Quality Monitoring (WQM), the Pacific Island Climate Update (ICU) and the Pacific Water and Climate Resource Centre

 **Water and Wastewater Asset Management:** Water supply, Sanitation and Hygiene (WASH) including RainWater Harvesting (RWH) and appropriate water and wastewater technologies, drinking Water Safety Planning (WSP), Water Demand Management (WDM)

 **Water Governance:** Pacific Integrated Water Resources Management (IWRM) programme, and the Pacific Partnership Initiative on Sustainable Water Management

The information portal also includes several features to keep you well informed and updated on what is happening on water, sanitation and hygiene in the Pacific Island Countries:

 The Pacific [Water Action Matrix Database](#) provides you with information about regional initiatives programmes and projects that are contributing to the implementation of the Pacific Regional Action Plan on Sustainable Water Management ([Pacific Water RAP](#)). You can [search](#) for projects to see how the Pacific Water RAP is being implemented, where and by whom. You can also help us to update the database by [inserting](#) missing information on initiatives that are not yet listed.





✿ The Country profiles contain basic facts and figures related to water, sanitation and hygiene for each Pacific Island Country with links to key documents.

✿ The [Resource Centre](#) will help you find key [documents](#), [links](#) and [SOPAC publications](#) related to water, sanitation and hygiene. In a near future, you will also be able to [search for links and resources](#) and access customized [toolkits](#) on key topics related to water, sanitation and hygiene, with an initial focus on Integrated Water Resources Management (IWRM).

✿ In [Events & Multimedia](#) you can find the latest water news from around the Pacific and an open-access [photo & video gallery](#) to help convey the message. There is also an [events calendar](#) which will help to keep you updated on key meetings and events on water, sanitation and hygiene, while the [travel planner](#) will help you find SOPAC water staff when we are on the move.

You can also sign up to the quarterly Pacific Water Partnership [E-newsletter](#) to get information straight to your email Inbox.

The website is a dynamic tool, and we will keep building on and adapting it with your help and input. As we go along, we will keep you updated on new features or facilities via email, and you can bookmark the site by pressing Ctrl+D on your browser so that you can easily come back.

For further information on the website, please contact:

Sanjeshni Naidu
Project Officer
Pacific Partnership Initiative on Sustainable Water Management
SOPAC Secretariat
Email: sanjeshni@sopac.org



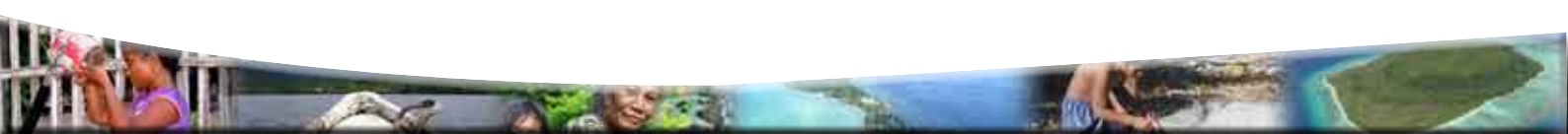
European Union

Adapting to Climate Change Relies on Better Water Management in the Pacific through National Coordination

There is a lot of activity in the region concerning adaptation to climate change and coping with the uncertainty of changing weather patterns and the effects this may have on the livelihoods and environment of Pacific Islands. Small Islands are highly vulnerable to the impacts of climate change because of their susceptibility to sea level rise, the location of important infrastructure and urban centres in coastal areas, often in floodplains, the reliance on groundwater for drinking water and coral reefs for food, and because most of the population lives in coastal zones.



It comes as no surprise to hear that changes in our climate will be most amplified in the water environment. Relatively small temperature changes will have large impacts on rainfall patterns, in some areas increasing flood events, and in other areas increasing drought periods. Intense rainfall events and tropical cyclones bring with them many short and long term effects, not only the obvious disaster consequences of high winds, flooding, and storm surges. Long term effects such as coastal and shoreline damage, increased soil erosion and run-off all have implications on other sectors such as food security, public health, and other basic needs. What is clear is that each country has a unique situation that must be taken into account before understanding the best adaptation approaches to take, but that there is also a need to move from assessment into action.





In response, policy makers are starting to take a broader and more inclusive approach to water management, referred to as integrated water resource management (IWRM). IWRM relies on a cross-sectoral multi-level approach to water management, seeking trade-offs between different water management objectives including environmental sustainability, economic efficiency and social equity. As the realities of climate change take affect on everyday lives IWRM provides a flexible framework to adapting to changes in a less predictable environment, and will need to consider not just one outcome but a range of scenarios which will need comparison in terms of risk, costs and benefits – as the climate is variable our way of dealing with it needs to be variable.

Often, the contribution of water to broad development and other goals is not well understood at the political level outside of the water sector, resulting in poor coordination between water and other sectors. To remedy this, the contribution of water to national economic and social goals needs to be recognised, and good water management needs to be prioritised.

For this to occur, water sector people need to engage with national development planning process such as National Sustainable Development Strategies, National Actions Plans for Disaster Risk Management and National Adaptation Plans of Action to climate change.



One way to do this is through the development of a National Water APEX Body as an inter-sectoral group comprising government, civil society and the private sector to improve the coordination of water resources and services in your country. A new document on National Water APEX Bodies has just been prepared by the Pacific IWRM Programme. The document is a first edition working document, designed to support Pacific Island Countries in the development of National Water Committees. Lessons learned will be collected and shared around the region so that the guidelines become dynamic and learn from Pacific country experience and suggestions.

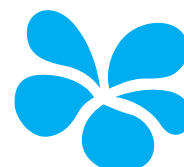
Reiterating the words of the Honourable Minister for Public Works in Niue, Mrs O’Love Jacobsen at the IWRM and HYCOS 2nd steering Committee Meeting earlier this year ‘Don’t be complacent. The forces of change in our environment will threaten to destroy our existence and survival. Manage your water resources with wisdom. The challenge for our region is very real. As we approach what seem like insurmountable problems, there has never been a greater need for commitment and dedication. A concerned effort on everyone’s part will ensure our security’.

For further information on Integrated Water Resources Management, please visit:
www.pacificwater.org/pages.cfm/water-governance/integrated-water-resource-management/
www.iwcam.org/

or contact:

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Background on Water in Small Island Countries

The global water community acknowledged the special vulnerability and particular needs of small islands by the inclusion of "Water in Small Islands Countries" as a special theme at the 3rd World Water Forum that was held in Kyoto, Japan from 16-23 March 2003. SOPAC and the Asian Development Bank (ADB) jointly led this Water in Small Island Countries session as well as its preparation through a regional consultation in the Pacific (Sigatoka, Fiji Islands, 2002).

A major outcome of the Pacific regional consultation was the Pacific Regional Action Plan on Sustainable Water Management (Pacific RAP), which details priority actions of the water sector in the region. This action plan, endorsed by 18 island countries, 14 at ministerial level, (and 16 countries at Head of State level including Australia and New Zealand) has been incorporated into the Type II Water Partnership Initiative and was submitted by the Pacific Island Countries to the UN Commission for Sustainable Development (CSD) in Johannesburg during the World Summit for Sustainable Development (WSSD) in August 2002.

The objective of this Partnership Initiative is to implement the Pacific Regional Action Plan on Sustainable Water Management, inclusive of its sister strategies, the Pacific Wastewater Policy Statement and the Pacific Wastewater Framework for Action, as effectively as possible.

Over 200 participants were involved in the national and regional consultations and the Water in Small Islands Countries session and they form the core of the Partnership. Now, over 750 individuals have joined this network. Hardcopies of the Regional Action Plan have been distributed to all attendees of Sigatoka and Kyoto and are available from the SOPAC Secretariat. In addition you can obtain more information through the following website:

<http://www.sopac.org/tiki/tiki-index.php?page=Water+in+Small+Islands+Consultations>

Arrangements of the Pacific Type II Partnership Initiative on Sustainable Water Management

The overall aim of the Partnership Initiatives is to ensure coordination and increased partnerships in meeting the WSSD goals through its Plan of Implementation.

The Pacific Partnership Initiative on Sustainable Water Management is coordinated and facilitated by the intergovernmental organisation SOPAC (South Pacific Applied Geoscience Commission), which has the regional mandate to support the Pacific Island Countries in water & sanitation. SOPAC is assisted in this task by a deputy facilitator, the University of the South Pacific (USP).

The Partnership has a Facilitator (based at SOPAC) who is responsible for implementing the core functions of the partnership: liaising between the regional stakeholder groups and their sub-networks; researching and receiving stakeholder information on on-going and planned water activities; tracking donor and development agency programmes; identifying areas requiring implementation; and coordinating proposal submissions and project implementation. The Facilitator is also responsible for high-level advocacy of the strategic approach.

Monitoring and evaluation are carried out using a matrix inventory of previous, existing, planned and proposed activities, including details of the stakeholders involved, the intervention objectives, implementation duration and status, and anticipated impact.

The Facilitator enables countries and development agencies to: identify successful previous activities and therefore improve the sustainability of subsequent interventions; reduce and prevent duplication of activities; link country requirements to development programmes (and vice versa); and augment existing and proposed activities nationally and regionally.

A working group of CROP agencies (Council of Regional Organizations of the Pacific) and NGO representatives has been set up to act as the overall coordinating body of the Pacific Type II Initiatives. Facilitators are asked to report to this Sustainable Development Working Group on a regular basis.

If you have comments on this Initiative or would like to make contributions and be further involved please do not hesitate to contact Marc Overmars marc@sopac.org



Publication



Converting commitment into action – Sanitation, hygiene and drinking water in the Pacific island countries

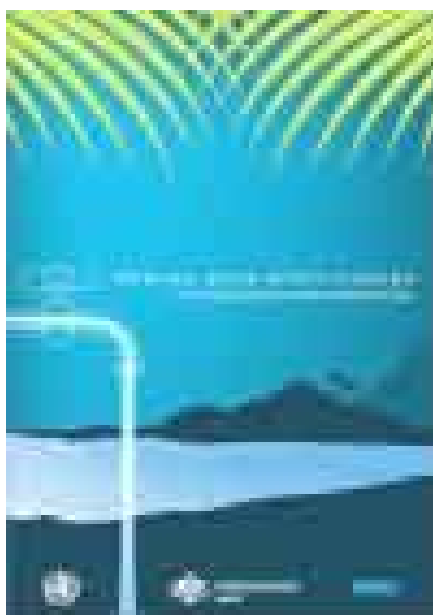
“Converting commitment into action – Sanitation, hygiene and drinking water in the Pacific island countries” provides a concise overview of a sector in need.

Statistics from the WHO and UNICEF Joint Monitoring Programme used in the report reveal persistent and direct impacts on the populations of 14 developing Pacific island countries from water, sanitation and hygiene related diseases.

As of 2006 only 48% of these populations had access to improved sanitation. Water supplies fare no better, with only 46% having access to improved sources of drinking-water, and just 13% having the ‘luxury’ of piped water. According to the report, at least 2,800 deaths each year - the equivalent of nine jumbo jets crashing - are ninety percent attributable to the diarrhoeal diseases which result from poor sanitation, hygiene and drinking water.

This Guide can be downloaded from the PacificWater website:

www.pacificwater.org/pages.cfm/resource-center/sopac-water-publications/



Drinking Water Safety Planning – A Practical Guide for Pacific Island Countries

The ‘Drinking Water Safety Planning – A Practical Guide for Pacific Island Countries’ has been developed to assist drinking water supply operators and managers improve the day-to-day management of the water supply with the objective of producing safe drinking water for consumers.

Drinking Water Safety Planning – A Practical Guide for Pacific Island Countries’ has been developed based on lessons learned and practical experience gained through an AusAID-funded joint SOPAC/WHO programme on drinking water safety planning in Pacific Island Countries. This project involved four pilot countries (Tonga, Cook Islands, Palau and Vanuatu). The lessons learned and approaches used by these countries provide the framework for drinking water safety planning explained in this Guide. The steps and processes described in this Guide are reinforced through case studies from the pilot countries.

This Guide can be downloaded from the PacificWater website:

www.pacificwater.org/pages.cfm/resource-center/sopac-water-publications/



Building partnerships for water and sanitation initiatives in the Pacific Region



Pacific WASH Coalition



The Pacific WASH Coalition supports regional initiatives in the area of water supply, sanitation and hygiene (WASH).

The Pacific WASH Coalition includes the following organisations: Foundation of the Peoples of the South Pacific International (FSPI), the Fiji School of Medicine (FSMed), Live & Learn Environmental Education (LLEE), the World Health Organisation (WHO), the United Nations Children's Funds (UNICEF), International Federation of Red Cross (IFRC) and the Pacific Islands Applied Geoscience Commission (SOPAC).

The Pacific Islands Applied Geoscience Commission based in Suva, Fiji has a regional mandate on water and sanitation and provides a secretarial role within the Pacific as a member of the global Water Supply and Sanitation Collaborative Council (WSSCC). Jointly the Coalition takes a coordinated approach in addressing the issues of access to safe water supply, adequate sanitation and improved hygiene practices for the people in the Pacific.

The Coalition utilises existing frameworks such as the Pacific Partnership Initiative on Sustainable Water Management, the Pacific Wastewater Framework for Action and the Pacific Framework for Action on Drinking Water Quality and Health to support countries achieving the MDG targets on water and sanitation.

Globally, but also in Pacific island countries, there is a vast need to improve hand washing and sanitation. Eighty-eight per cent of cases of diarrhoeal diseases worldwide are attributable to inadequate sanitation, unsafe water and poor hygiene. In the Pacific island countries, the year 2002 saw the incidence of 871 cases of acute diarrhoea per thousand people, causing the death of 2800 people. More severe forms of diarrhoeal diseases include cholera, typhoid and dysentery.

Pacific Water and Sanitation Flyer

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The Pacific Water and Sanitation Flyer can be downloaded from the PacificWater website:

www.pacificwater.org/pages.cfm/news?newsid=pacific-wash-coalition



The Pacific Integrated Water Resource Management Programme Brochure

A brief colourful overview of Integrated Water Resources Management (IWRM) and the aims and activities of the Pacific IWRM programme.

Hard copies of the IWRM brochure are available on request via iwrm@sopac.org or can be downloaded from the IWRM website:

www.sopac.org/tiki/tiki-index.php?page=IWRM+Outputs





National Water Apex Bodies – a guide for Pacific Island Countries

This is a brief introduction to some of the key issues and steps to be considered in the establishment and strengthening of National Water Apex Bodies (NWABs) in Pacific Island Countries. It endeavours to give the reader some initial advice on questions such as:

- ❁ What is the point of establishing an NWAB in the first place?
- ❁ Who should be involved in the NWAB and how do you involve them?
- ❁ How do you run the day-to-day work of the NWAB in order to achieve national goals and to ensure impact on the ground?

More specifically, the guide aims to help national civil servants involved in strengthening NWABs to draft or revise Terms of Reference for their National Water Apex Bodies in order to support reform towards integrated water resources management. For this purpose, the guide includes a checklist for Terms of Reference as Annex 1.

The guide has been put together by SOPAC with funding from the European Union as part of the Pacific IWRM Programme, and is based on issues emerging from the process of developing national diagnostic analyses on IWRM and from the IWRM Planning Meeting held in Niue in July 2008.

This is a first edition and should not be seen as a complete review but rather a brief introduction to the basics. Feedback on the content and the usefulness of this guide, and suggestions for how to improve it, are gratefully received by iwrm@sopac.org



IWRM Community Mobilisation Guidelines

The final Community Mobilisation Guidelines to help assist communities and facilitators working with them to look at IWRM approaches at a village and community level are now available.

Developed by Live and Learn Environment Education, supported by SOPAC and UNDP and UNEP, the guidelines are a key output from the Project Design phase of the Sustainable Integrated Water and Wastewater Management project supported by the Global Environment Facility. This project will work with 14 countries in the Pacific starting in 2008. Through a network of national Demonstration Projects supported by regional capacity building components the project aims to raise awareness on IWRM approaches and strengthen national and regional approaches to integrate improved water management in the water sector and into wider national and community interventions.

The **IWRM Community Mobilisation Guidelines** is available on SOPAC website for download:
<http://www.sopac.org/tiki/tiki-index.php?page=CLP+Publications>



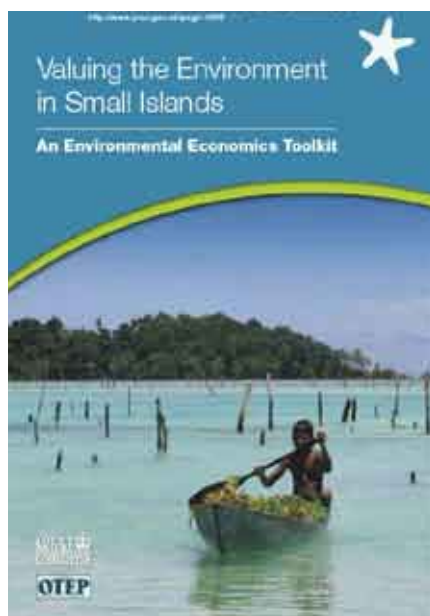


Integrated Water Resource Management in Pacific Island Countries A Synopsis

Under the Global Environment Facility funded Integrated Water Resources and Wastewater Management Project 14 countries of the Pacific Region prepared detailed Diagnostic Reports summarising the status of their water resources and assessing the barriers to implementing Integrated Water Resource Management (IWRM) approaches in their respective countries. This Synopsis report represents a summary of the 14 Diagnostic Reports, providing a baseline status of IWRM approaches in country. It will provide a useful monitoring report over the coming years as countries start to implement IWRM approaches. The report provides some simple solutions to achieving IWRM in small island environments.

Copies of the **Synopsis Report** are available directly from SOPAC, or can be downloaded from the IWRM website:

<http://www.sopac.org/tiki/tiki-index.php?page=IWRM+Outputs>



Valuing the Environment in Small Islands

Although a large number of guides already exist on aspects of environmental valuation, none of these references specifically focus on the issues and needs of small islands. This toolkit was developed to address this gap. Its core aim is to provide a practical resource to meet the pressing needs of a group of pioneering stakeholders in Bermuda, the Cayman Islands and Montserrat who will lead valuation studies, but have no, or only limited, knowledge of environmental economics. In addition, the toolkit is designed to be of use to a wider audience of stakeholders in small islands around the world who wish to learn about practical aspects of environmental valuation, but struggle to find a reference adapted to small island contexts.

The development of this toolkit was jointly funded by OTEP and the Joint Nature Conservation Committee (JNCC). OTEP is a joint programme of the UK Government Foreign and Commonwealth Office and the Department for International Development to support the implementation of the Environment Charters and environmental management more generally in the UK Overseas Territories. JNCC is the statutory adviser to the UK Government on UK and international nature conservation, including in the UK Overseas Territories.

http://www.jncc.gov.uk/pdf/pub07_environmental%20toolkitcp1-3.pdf

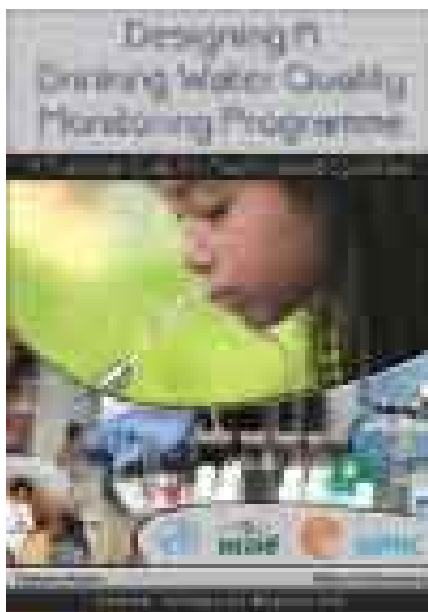
For more details on the UK Overseas Territories valuation projects please visit the following website:

<http://www.ukotcf.org/OTEP/docs/OTEP2007PROJECTS.pdf>

For more details on the UK Overseas Territories Environment Charters please visit:

http://www.ukotcf.org/OTEP/docs/general_brochure.pdf





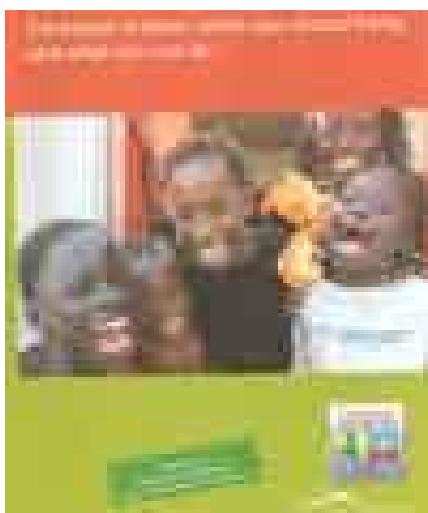
Designing A Drinking Water Quality Monitoring Programme "A Practical Guide for the Pacific Island Countries"

Contamination of drinking water is a significant concern for public health throughout the world. It is important for Pacific island countries (PICs) to identify, prioritize and analyse water quality parameters that are of greatest risk to human health. This will ensure that viable and useful information on the status of drinking water quality is achieved within the existing resources (budget, staff and laboratory capacity).

This guide provides the opportunity and direction for Pacific Island Countries (PICs) to design a feasible and useful drinking water quality monitoring programme that is conscious of their existing, and in some instances limited, resources. It is aimed at assisting agencies involved with water quality monitoring roles design a practical and workable monitoring programme for their country and purpose.

The Guide has been produced and published under the NZAID-funded Pacific Water Quality Monitoring Capacity Building (WQM) Programme which is being implemented by the Pacific Islands Applied Geoscience Commission (SOPAC), the World Health Organization (WHO) and the Institute of Applied Sciences of the University of the South Pacific (IAS-USP).

For copies of the guide please contact SOPAC Water Quality Programme Officer (tasleem@sopac.org)



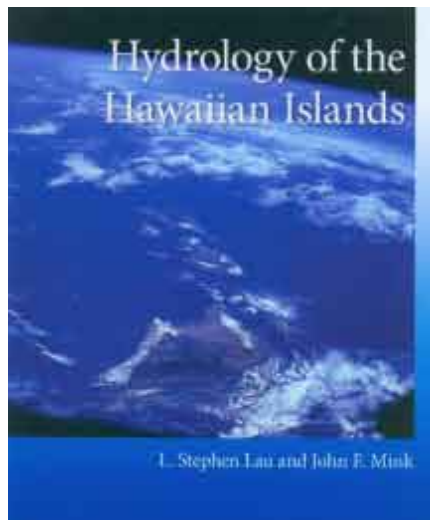
Sanitation matters: what you should know, and what you can do Advocacy kit

2008 is the International year of Sanitation. This kit is designed to further specific goals of the year, namely to increase awareness about the sanitation crisis as well as to secure commitments and mobilize action from the government and other stakeholders to address this global emergency.

The kit contains a **booklet** that summarizes briefly why sanitation matters, detailed **fact sheet** on the links between sanitation and health, economic development, social development and dignity, and environment, a **matrix** that demonstrates clearly that the sanitation crisis affects everyone and that everyone can contribute to solving it, a **list of useful websites, talking points** on sanitation, and a **poster**. Journalists and others in the media will also receive in their kit **recorded interviews** (as well as **transcripts**) with leading experts that can be used in radio or print stories as well as **photographs** and various **figures** that can be reproduced. Professional; campaigners will find an **advocacy guide** in their kit.

For more information on the kit and its content, contact the Water Supply and Sanitation Collaborative Council (WSSCC), Geneva, Switzerland, wsscc@who.int.



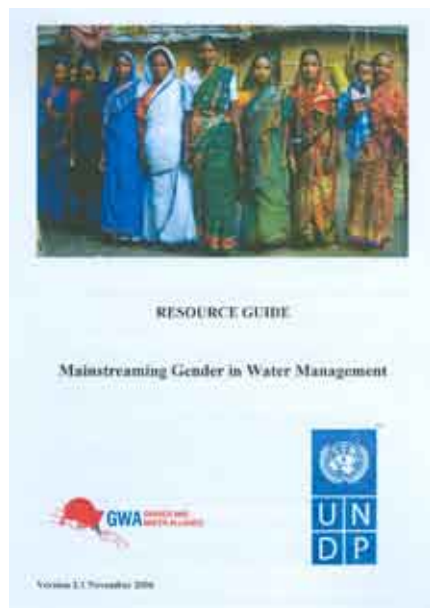


Hydrology of the Hawaiian Islands

Why is groundwater the predominant drinking water source in Hawaii? Why are groundwater sources susceptible to pesticide contamination? How long does it take for water in the mountains to journey by land and underground passages to reach the coast? Answers to questions such as these are essential to understanding the principles of hydrology—the science of the movement, distribution, and quality of water—in Hawaii. Due to the humid tropical climate, surrounding ocean, volcanic earth, and high mountains, many hydrologic processes in the Islands are profoundly different from those of large continents and other climatic zones. Management of water, land, and environment must be informed by appropriate analyses, or communities and ecosystems face great uncertainty and may be at risk. The protection of groundwater, coastal waters, and streams from pollution and the management of flood hazards are also significant. This volume presents applications of hydrology to these critical issues.

The authors begin by outlining fundamental hydrologic theories and the current general knowledge then expand into a formal discussion specific to Hawaii and the distinctive elements and their interrelations under natural and human-influenced conditions. They include chapters on rainfall and climate, evaporation, groundwater, and surface runoff. Details on the quantification of hydrologic processes are available to those with more technical knowledge, but general readers with an interest in the topic—one of singular importance for the Hawaiian Islands—will find much in the volume that is timely and accessible.

For further information on **Hydrology of the Hawaiian Islands** please visit the following link: www.uhpress.hawaii.edu/cart/shopcore/?db_name=uhpress&page=shop/flypage&product_id=4226

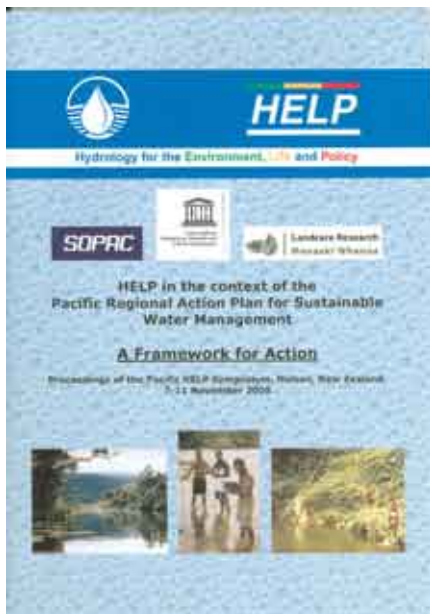


Resource Guide - Mainstreaming Gender in Water Management

This is the second edition of the Resource Guide on Mainstreaming Gender in Water Management of August 2006, which was first published by the United Nations Development Programme (UNDP) in 2003. The Guide is a reference document to assist water and gender practitioners and professionals as well as persons responsible for gender mainstreaming, and anybody else who is interested in the water sector. It is a compilation of newer resources – documents, papers, books, case studies, tools and toolkits - on gender mainstreaming in Integrated Water Resource Management (IWRM). It is meant to support action and further reading and research.

For the regular updating of the website version of the **Resource Guide** please visit the following website: www.genderandwater.org/





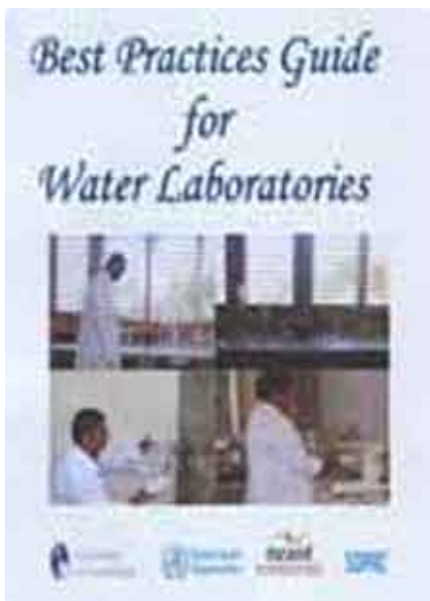
Hydrology for the Environment, Life & Policy

HELP (**Hydrology for the Environment, Life & Policy**) is a joint initiative of the United Nations Educational Scientific Organization (UNESCO) and the World Meteorological Organization (WMO). HELP is led and coordinated by UNESCO's International Hydrological Programme (IHP). In the Pacific, the IHP is administered by the UNESCO Office for the Pacific States in Apia, Samoa, through a memorandum of understanding with the South Pacific Applied Geoscience Commission (SOPAC).

Under the title "HELP in the context of the Pacific Regional Action Plan for Sustainable Water Management: A Framework for Action", the proceedings of the Pacific HELP Symposium were prepared in response to the recommendations by the Pacific Island country participants and supports the implementation of catchment management actions envisioned in the overarching Pacific Regional Action Plan on Sustainable Water Management.

This document consists of the Framework for Action itself, as well as a CD-Rom containing electronic editions of all presentations and papers delivered at the HELP Symposium.

Participating Pacific Island Countries in the HELP Symposium: Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands and Vanuatu.



Best Practices Guide for Water Laboratories

The guide is prepared as part of the NZAID-funded Pacific Water Quality Monitoring Capacity Building Programme that is being implemented by SOPAC, WHO and IAS-USP. It is intended to be a resource guide for small PIC water laboratories on best practices that can be employed in water laboratories.

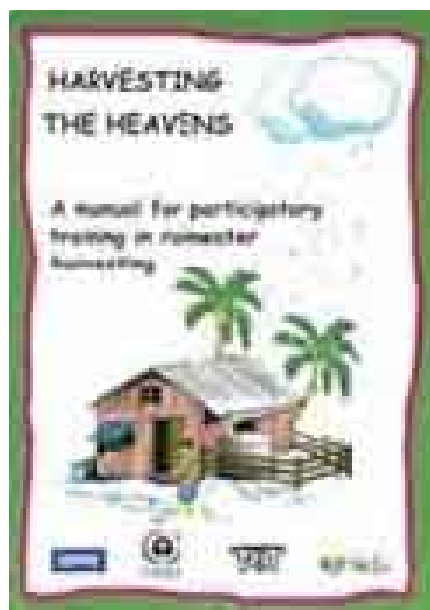
The Guide is comprises two parts:

Part 1 - outlines the 10 keys features that an ideal water quality monitoring laboratory is recommended to have in order to successfully conduct its role.

Part 2 - outlines other aspects that are to be addressed in supporting the development of a water monitoring laboratory.

For more information on the guide or to obtain copies, please contact **SOPAC Secretariat** (tasleem@sopac.org).





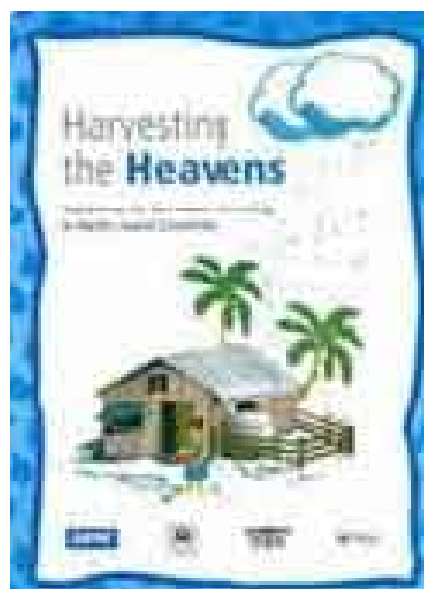
Participatory Training in rainwater Harvesting

This manual of **Participatory Training in rainwater Harvesting** was developed as part of the United Nations Environment Programme (UNEP) project titled "Pilot Project on Empowering Women in Rainwater Harvesting in the Pacific Atoll Islands" with funding from the Government of Sweden.

The manual is targeted for use by Non-Government Organisations (NGOs), Community-Based Organisations (CBOs) or people involved in rainwater harvesting, and contains a number of participatory techniques, tools and activities based on best practices from a variety of sources.

Copies of this Manual can be obtained from the **SOPAC Secretariat** (arieta@sopac.org) or you can download the document via the following website:

<http://www.sopac.org/CLP+Rainwater+Harvesting>



Harvesting the Heavens: Guidelines for the Rainwater Harvesting in the Pacific Island Countries

The "**Harvesting the Heavens: Guidelines for the Rainwater Harvesting in the Pacific Island Countries**" were developed as part of the United Nations Environment Programme (UNEP) demonstration projects on "Empowering Women in Rainwater Harvesting" funded by the Government of Sweden through their development agency SIDA and carried out in Africa (Kenya) and the Pacific (Tonga).

The guidelines capture the lessons learned during the preparation and the implementation of the demonstration project executed by the South Pacific Applied Geoscience Commission (SOPAC) and carried out in the Island group of Vava'u of the Kingdom of Tonga through the Village Women's Development Programme (VWDP) of the Tonga community Development Trust (TCDT).

Copies of this Guideline can be obtained from the **SOPAC Secretariat** (arieta@sopac.org) or you can download the document via the following website:

<http://www.sopac.org/CLP+Rainwater+Harvesting>





Pacific Regional Action Plan



National consultations as well as a regional meeting held in Sigatoka, Fiji from 29 July – 3 August 2002 provided a platform through which participants translated ideas into decisions and policy changes on water and sanitation resulting in the Pacific Regional Action Plan on Sustainable Water Management (Pacific RAP).

The outcomes of the consultation were carried forward and presented during the 3rd World Water Forum in Kyoto as part of the theme "Water in Small Island Countries".

Copies of the **Pacific Regional Action Plan** can be obtained from the **SOPAC Secretariat** (kamal@sopac.org) or you can download the document via the following website:

<http://www.sopac.org/CLP+Publications>



ICU bulletin

Contamination of drinking water is a significant concern for public The ICU is a multi-disciplinary, multi-national project providing Pacific island countries with 3-month climate forecasts. It is published monthly both in print and online by the National Institute of Water and Atmospheric Research (NIWA) in New Zealand and is funded by NZAID. Every month, 1200 printed copies of the ICU are distributed free-of-charge by NIWA, the publisher, directly to subscribers.

Online versions of the **ICU bulletin** can be downloaded from the following **NIWA ICU** website:

<http://www.niwascience.co.nz/ncc/icu/archive>





Water Quality Monitoring in Pacific Island Countries

The Water Quality Monitoring in the picture is the first of its kind guideline that has been developed by the Institute of Applied (IAS) of the University of the South Pacific (USP) and the South Pacific Applied Geoscience Commission (SOPAC). The publication is divided into sections on how to design a water quality monitoring programme; selection of drinking and recreational water sampling; solid and liquid waste management and general notes on sampling and laboratory procedures.

This handbook is aimed for those people working in the water and wastewater sectors in the Pacific region, with local examples to allow more understanding and adaptation.

Copies of the **Water Quality Monitoring in Pacific Island Countries** can be obtained from the **SOPAC Secretariat** (tasleem@sopac.org) or you can download the document via the following website:

www.sopac.org/tiki/tiki-sopac_download.php?path=/data/virlib/TR/TR0381.pdf&file=TR0381.pdf&loc=TR



Directory of Environmentally Sound Technologies for the Integrated Management of Solid, Liquid and Hazardous Waste for Small Island Developing States (SIDS) in the Pacific Region

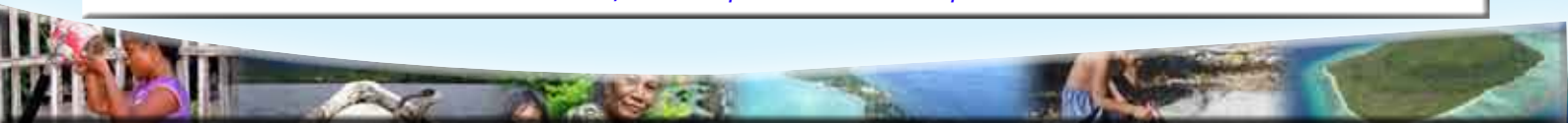
The Directory of Environmentally Sound Technologies for the Integrated Management of Solid, Liquid and Hazardous Waste for Small Island Developing States (SIDS) in the Pacific Region represents the combined efforts and achievement of numerous people from UNEP, SOPAC and SPREP.

The directory provides an overview of solid, hazardous and wastewater technologies.

- Solid waste technologies - discuss information on different municipal solid waste management (MSWM) technologies that are currently used in different regions of the world.
- Hazardous Waste Technologies - addresses the proper management of various types of hazardous wastes, as they require special handling, treatment and disposal due to their hazardous potential.
- Liquid waste or wastewater technologies - in SIDS wastewater disposal systems are just as important for public health as a water supply distribution system.

Copies of the **Directory of Environmentally Sound Technologies for the Integrated Management of Solid, Liquid and Hazardous Waste for Small Island Developing States (SIDS) in the Pacific Region** are available from the **SOPAC Secretariat** (kamal@sopac.org) or you can download the document via the following website:

www.sopac.org/tiki/tiki-sopac_download.php?path=/data/virlib/JC/JC0143.pdf&file=JC0143.pdf&loc=JC





World Water Day Campaign

The World Water Day "Water for Life 2005-2015" Activity Booklet has been produced for schools and communities to further consider water issues through participative activities. The Activity Booklet should be used with the Water for Life Cartoon Scenes on the posters or calendars as the activities are linked to each cartoon scene. Alternatively, it can be used on its own to address different components of the theme "Water for Life".

Copies of the **World Water Day Campaign** are available from the **SOPAC Secretariat** (kamal@sopac.org) or **Live & Learn Environment Education** (marie@livelearn.org.fj). You can also download the document via the following website:

<http://www.sopac.org/WWD+2007>



Guidelines for Drinking - Water Quality

Since the second edition of WHO's Guidelines for Drinking water Quality, there have been a number of events that have highlighted the importance and furthered understanding of various aspects of drinking-water quality and health. These are reflected in this 3rd edition of the Guidelines.

The Guidelines are addressed primarily to water and health regulators, policy-makers and their advisors, to assist in the development of national standards. The Guidelines and associated document are also used by many others as a source of information on water quality and health and on effective management approaches.

Copies of the **Guidelines for Drinking - Water Quality** are available from **WHO's website**: http://www.who.int/water_sanitation_health/dwq/gdwq3/en/ or from the **WHO's Pacific Regional Office** (IddingsS@sp.wpro.who.int).





Tapping Water Connections

Everyone uses water and everyone needs some kind of sanitation. The way water is used depends on the island where you live: the climate, the landforms, and the source of water. It also depends on the tradition and customs of the family and community, their income and the size of the population.

The handbook **"Tapping Water Connections"** can be used by field workers when working with communities to install and maintain water and sanitation systems. It can also be used to support health and hygiene programmes. The handbook raises seven Questions to think about. The Questions can be a checklist to identify important connections between people and their water and their land.

Copies of the Manual can be obtained from the **SOPAC Secretariat** (arieta@sopac.org) or you can download the document via the following website:

<http://www.sopac.org/data/virlib/MR/MR0577.pdf>

Multimedia

Don't Bug Me? – Pathogens and Pathways in Drinking Water Supplies

This is the DVD 1 of the four series produced by New Zealand Ministry of Health and can be used in the Water Safety Plans programme as public awareness material. This video informs on the access and presence of pathogens in the drinking water supplies. It is intended for the small drinking water supplies and can be used in the Pacific Island Countries.

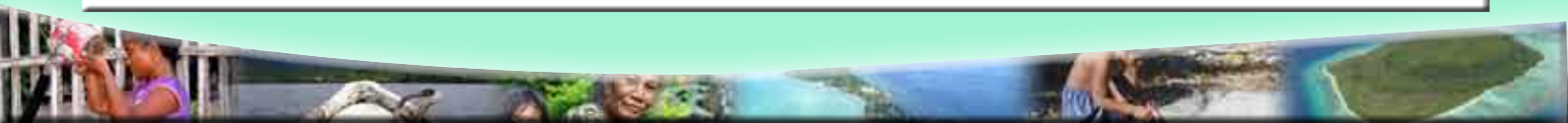
Copies of this documentary are available from New Zealand , Ministry of Health.



Making It Safe? - Principles and Methods of Treatment for Small Drinking Water Supplies

This is the DVD 2 of the four series produced by New Zealand Ministry of Health and can be used in the Water Safety Plans Programme as public awareness material. This video informs on the principles and methods of treatment for small drinking water supplies. It can be used for educating the pacific island communities as well.

Copies of this documentary are available from New Zealand Ministry of Health.

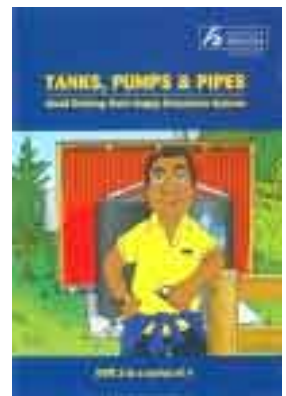




Tanks, Pumps & Pipes - Small Drinking Water Supply Reticulation Systems

This is the DVD 3 of the four series produced by New Zealand Ministry of Health and can be used in the Water Safety Plans Programme as public awareness material. This video informs on reticulation system for small drinking water supplies. It can be used for educating the pacific island communities as well.

Copies of this documentary are available from New Zealand Ministry of Health.



Checking it Out - Sampling and Monitoring of Small Drinking Water Supplies

This is the DVD 4 of the four series produced by New Zealand Ministry of Health and can be used in the Water Safety Plans Programme as public awareness material. This video provides information on the sampling and monitoring of small drinking water supplies. It can be used for educating the pacific island communities as well.

Copies of this documentary are available from New Zealand Ministry of Health.



Cap-Net - IWRM Tutorial

This DVD contains a brief introductory tutorial aimed at policy makers, water managers, trainers and educators who want a basic understanding of IWRM principle. It provides the case for IWRM and the argument against those who may oppose it on institutional or sectoral grounds.

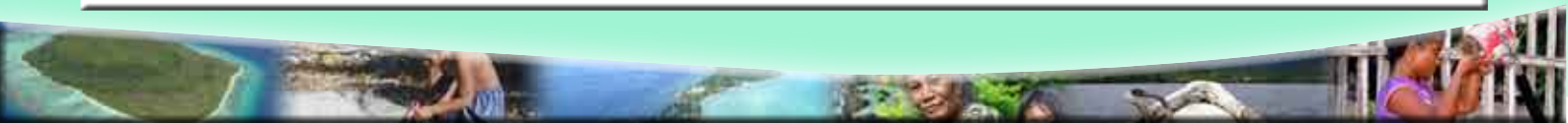
Copies of the **Cap-Net - IWRM Tutorial DVD** can be obtained from the **United Nations Development Programme**.



Toolbox

This DVD contains a brief introductory tutorial aimed at policy makers, water managers, trainers and educators who want a basic understanding of IWRM principle. It provides the case for IWRM and the argument against those who may oppose it on institutional or sectoral grounds.

Copies of the **Toolbox DVD** can be obtained from the **Global Water Partnership Secretariat**.



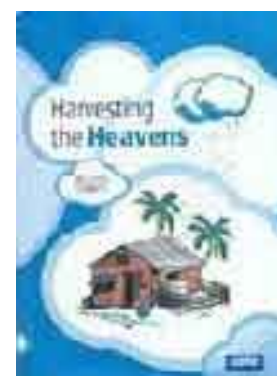


Harvesting the Heavens

A DVD documentary which follows the pilot project in Vava'u. The video highlights the important aspects of the project including community participation and ownership, encouraging women as well as men to participate in water management and promoting sustainable approaches. Harvesting the Heavens follows a rainwater harvesting demonstration project carried out in the villages of 'Utungake and Matamaka in the island group of Vava'u in Tonga. The project focused on the importance of community participation and ownership, encouraging women as well as men to participate in water management and promoting sustainable approaches.

Copies of the **Harvesting the Heavens documentary** can be obtained from the **SOPAC Secretariat** (kamal@sopac.org) or you can download the document via the following website:

<http://www.sopac.org/CLP+Rainwater+Harvesting>



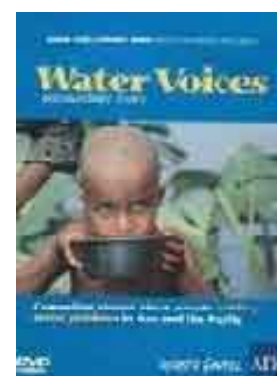
Water Voices Documentary Series

Water is essential to all life. And yet one in three Asians lacks access to safe drinking water, and half the people living in Asia and the Pacific do not have access to adequate sanitation. Conflicts over sharing of scarce water resources are increasing at an alarming rate.

A documentary series that recognizes the power of good examples and lessons learned to inspire 'home grown' solutions to water problems. The series recognizes the power of good examples and lessons learned to inspire 'home grown' solutions to water problems and looks specifically at communities in Fiji, Kiribati and Tonga.

Copies of this documentary can be obtained from the **SOPAC Secretariat** (arieta@sopac.org) or the **Asian Development Bank**

http://www.adb.org/Water/CFWS/Water_Voices_Videos.asp

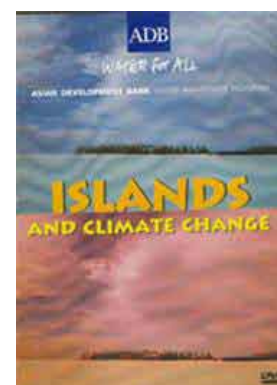


Islands and Climate Change

Islands and Climate Change examines and reports on a unique initiative on Fiji's Coral Coast where coastal communities and the tourist industry try to protect water resources. The Water Awareness Program aims to increase public understanding about vital water issues in the Asia and Pacific region; promote water sector reform; improve delivery of water services, especially to the poor; and foster conservation and integrated management of water resources.

Copies of this documentary can be obtained from the **SOPAC Secretariat** (arieta@sopac.org) or the **Asian Development Bank**.

http://www.adb.org/Water/CFWS/Water_Voices_Videos.asp



Pacific Water Agenda 2008

DATE	EVENT	LOCATION	DETAILS
October 21st - 30th	SOPAC Annual Session and STAR Water Working Group Meeting	Funafuti, Tuvalu	For more information on SOPAC Annual Session and STAR Working Group please visit: www.sopac.org/Annual%20Session%202008-Tuvalu
October 27th - 29th	An international conference hosted by World Vision Australia and supported by the Australian Government, AusAID	The Langham Hotel, Southbank, Melbourne, Australia	The conference will seek to review the status of sanitation and water in East Asia and the Pacific region, review best practice and key entry points and devise actions and approaches that can best provide large scale sustainable solutions with a view to achieving the Millennium Development Goals. The conference will also provide a forum for AusAID to discuss its increased focus on water and sanitation.
November 17th - 21st	Coastal Cities Summit 2008	St Petersburg, Florida, USA	One of the most challenging issues facing the ocean today is rapid coastal urbanization whose implications have yet to be assessed. Today, the majority of the world's population lives within sixty kilometres of the coast line and this is steadily increasing. This profound demographic shift has significant implications for the coastal environment, inhabitants and ecosystem stability. www.coastalcities.org/
November 19th	World Toilet Day	International	World Toilet Organization (WTO) is a global non- profit organization committed to improving toilet and sanitation conditions worldwide. Please visit: http://www.worldtoilet.org/
December 3rd	Advisory Committee Meeting for WQM	SOPAC	To discuss implementation of the WQM Programme over the last 2.5 years. To decide on workplan for remainder of programme. Key stakeholders present will be NZAID, WHO, IAS-USP and SOPAC.
December 3rd - 5th	Third & Final Seminar on Water management in islands Coastal and Isolation areas	Hawaii	An International PECC Project jointly organized by FPTPECC , the East-West Center and the World Water Forum
December 4th - 5th	5WWF Preparation Meeting	Geneva, Switzerland	2nd Preparatory Committee Meeting (PrepCom) of the Ministerial Process. For more information please visit: www.worldwaterforum5.org

Selected Water Websites

ADB Water in Small Island Countries www.adb.org/Water/theme3.asp	Pacific ENSO Update http://lumahai.soest.hawaii.edu/Enso/subdir/update.dir/update.html
AOSIS Alliance of Small Island States www.sidsnet.org/aosis	Pacific Water Association www.pwa.org.fj
AUSAID www.usaid.gov.au	SIDSNET www.sidsnet.org
Australian Water Portal www.developmentgateway.com.au/water/index.html	UNEP http://freshwater.unep.net/
Barbados +10 www.sidsnet.org/Mauritius2004/	UNESCAP www.unescap.org
CSD12 www.un.org/esa/sustdev/csd/csd12/csd12.htm	UNESCO www.unesco.org/water
CSD13 http://www.un.org/esa/sustdev/partnerships/csd13_partnership_fair.htm	UNU www.inweh.unu.edu/inweh
Co-operative Programme on Water and Climate www.waterandclimate.org	WHO www.who.int/water_sanitation_health/en/
East-West Centre www.EastWestCenter.org/climate	WMO www.wmo.ch/web/homs/index.html
ESCAP www.unescap.org/esd/water/activities	World Bank www.worldbank.org/html/fpd/water
European Union www.europa.eu.int/comm/development/publicat/water/en/frontpage_en.htm www.euwi.net	SOPAC Water www.pacificwater.org
Gender and Water Alliance www.genderandwateralliance.org	World Water Council www.worldwatercouncil.org
Global Water Partnership www.gwpforum.org	USP www.usp.ac.fj
GWP Australia www.gwpaustralia.org	WSSCC http://www.wsscc.org/
Island Climate Update www.niwa.cri.nz/NCC/ICU	NIWA www.niwa.co.nz
NZAID www.nzaid.govt.nz	SPC www.spc.int
USGS http://hi.water.usgs.gov	Japan Water Forum http://www.waterforum.jp/eng/index.html
Water Virtual Learning Centre (WVLC), University of the South Pacific www.earth.fst.usp.ac.fj/index.php?id=4043	UN-Water http://www.un.org/waterforlifedecade/
World Summit on Sustainable Development www.johannesburgsummit.org	World Wide Fund for Nature www.wwfpacific.org.fj
International Commission on Irrigation and Drainage http://www.icid.org	Cap - Net www.cap-net.org/
Climate Front Lines www.climatefrontlines.org	PI-GOOS www.pi-goos.org

--- Please let us know if you think other websites are worth mentioning here! ---

We have changed the frequency of issuing this newsletter from semi-annually to quarterly so you can be kept updated on the latest developments. As mentioned in earlier mail outs we would appreciate it if you could forward this to colleagues who may be interested in this initiative so that it reaches the widest possible audience.

To subscribe please send an email to sanjeshni@sopac.org to add your contact to our mailing list. and

Send a blank email message with the words "unsubscribe" in the subject field to: sanjeshni@sopac.org to unsubscribe from this list if you wish not to receive any further issues in the future.

The Pacific Water Partnership Initiative News is produced by the Pacific Partnership Initiative on Sustainable Water Management for Water Awareness Program to provide water information to Pacific member governments, professionals, researchers, private sector and their counterparts in the donor community who are interested in water sector issues and initiatives.

For comments or more information:

Marc Overmars

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SOPAC Pacific Islands Applied Geoscience Commission

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Web site: <http://www.pacificwater.org>



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