



PACIFIC ISLANDS APPLIED GEOSCIENCE COMMISSION

INTER OFFICE MEMO

To : Director, Deputy Director, and SOPAC Water Sector.
From : Davendra Nath, Water Safety Plans Officer,
Date : 11/05/2006
Subject: Cooks Scoping Mission- Water Safety Plans Programme.

MISSION REPORT

Subject: Drinking water quality, Cook Islands

Place visited: Rarotonga, Cook Islands

Dates: 1-7 April 2006

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Title of project: Pacific Water Safety Plans Programme
HSE: Healthy settings and environment

Participating agencies: Ministry of Works
Ministry of Health
National Environment Service
South Pacific Applied Geo-science Commission
World Health Organization

Source of funds: AusAID/SOPAC

Key word: Environmental health/ water safety plans/ drinking water quality/ Cook Islands

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1. PURPOSE OF MISSION

The mission to the Cook Islands was jointly fielded by the Director, Pacific Islands Applied Geoscience Commission (SOPAC) and the WHO Representative - South Pacific following the request from the Cook Islands Ministries of Works and Foreign Affairs, the SOPAC focal point in the Cook Islands.

The scoping mission was arranged to assess the commitment of the Cook Islands government and to identify partners for a possible Water Safety Plans Programme. The team comprised of Mr. Davendra Nath, SOPAC Project Officer and the writers Mr. Mitesh Mudaliar and Mr. Steven Iddings of WHO. The team's terms of reference were as follows: (1, 2, 3 and 4.)

2. BACKGROUND

A new risk-assessment / risk-management approach to ensuring safe drinking water was introduced to Pacific island countries in workshop in February 2005 organized by WHO. That gathering of 18 countries in Nadi, Fiji, also completed a 'Pacific Framework on Drinking Water Quality and Health' to guide future activities and gather donor support. The meeting of Pacific Islands Health Ministers endorsed the 'Framework' two months later. Three water quality programmes have since been proposed for the Pacific Island countries.

The 'Pacific Water Safety Plans Programme' began in late 2005 under AusAID funding to the regional organizations WHO and SOPAC. This two-year joint programme will pilot Water Safety Plans in at least four Pacific island countries. The Cook Islands is among the four countries selected from the ten eligible. The WHO/SOPAC scoping mission was proposed to determine the scope and interest and secure commitment of key government counterparts: the Cook Islands Ministry of Works (MoW), the Ministry of Health (MoH), National Environmental Services (NES) and other potential partners. The MoW applied to WHO/SOPAC for the possible support under the Pacific WSP Programme and requested the mission.

Cook Islands comprises two main groups of islands, Northern and Southern, with the majority of its 12,000 population living on the largest island in the Southern Group, Rarotonga, the national capital. Rarotonga like most of the Southern Group is of volcanic origin. Most of the other islands are atolls with fragile fresh water lenses and small populations. The Cook Islands biggest industry is tourism, centered mainly on Rarotonga and Aitutaki, an atoll in the Southern Group with an international airport.

The Ministry of Works, Department of Water Works has responsibility for the piped water supplies country-wide and most notably for the piped water supply on Rarotonga with a population of 12,000. The Ministry of Health (MOH) is responsible for water quality surveillance of all water supply systems, reinforced by the 2004 Public Health Act. The Office of the Minister for Island Affairs has responsibilities for island water supplies but receives help from MoW as well.

Rarotonga Island is only 32 km in circumference, and ringed by narrow coastal plain supporting virtually all homes and development. A relatively pristine inland of steep terrain shelters with twelve catchments which direct mostly untreated water through a pipe grid to all Rarotonga communities. Sixty percent of households are said to use rainwater to supplement their piped supply.

WHO and SOPAC in particular have supported drinking water activities in Cook Islands in recent years. SOPAC with local participation supported hydro geologic investigation and mapping on Aitutaki Atoll in 2004. The outputs of the Pacific International Waters Project (IWP) were already known to the mission and proved a significant experience for a potential Water Safety Plans Project in Cook Islands to build upon

3. ACTIVITIES AND FINDINGS

3 :1 Activities

The team visited Rarotonga from 1- 7 April 2006, including relevant sites on the piped water system. The mission was hosted by the Ministry of Works which organized all meetings with relevant government and development partners and Cook Islands Association of Non Government Organizatios (CIANGO), the umbrella Non Government Organization. The programme of the mission and the full list of officials contacted appear in annexes 1 and 2, respectively. A number of relevant books and documents were provided to potential partners, agencies and officials as per Annex 4.

3 :2 Findings

Monday 03 April 2006

9am – 12 pm

The team met with Minister of Works Hon. Ms. Ngamau Munokoa, , Mr. Ata Herman, Permanent Secretary, Ministry of Works, Mr. Ben Parakoti, Director, Department of Water Works, Mr. George Cowan, Consultant, Mr. Adrian Teotahi, Water Quality Specialist and Mr. Paul Maoate, Assistant Engineer, Department of Water Works. The benefits of the Water Safety Plans programme were discussed with the officials. The Minister of Works indicated her support for the implementation of Pilot WSP Project(s). Mr. Ben Parakoti described the existing Rarotonga Water Supply system and highlighted on some of the problems. Mr. Ata Herman informed the Team that there is a cordial relationship between Ministry of Works and Ministry of Environment and a working relationship with the Ministry of Health. The Team was informed that currently there is no treatment stage in the water supply system. The Department of Water Works is mainly concerned with the quantity of water rather than quality due to many other constraints. There are least concerns with the drinking water quality; however, the tourists are advised to boil the tap water for drinking. There are some issues with 'chocolate' water coming out of taps during or immediately following rain events. There are 12 surface water intakes on Rarotonga and 4 ground water galleries.

1.30pm

Mr. Ben Parakoti described the operations of the Department of Water Works and mentioned about the resource constraints to the mission team.

3.00pm

The team toured 2 water intakes (*Avatiu* and *Tupapa* intakes) with assistance from Dept of water works who provided transport and guidance. Assessment of the system was done with the focus on the risk of contamination.

Tuesday 04 April 2006

9am – 12pm

The Team met with Mr. Vaitoti Tupa, Director of National Environment Service, Mr. Otheniel Tangianau, CEO, Office for the Ministry of Island Administration, Mr. Tauraki Raea, International Waters Project

National Coordinator, NES, Ms. Deyna Marsh, IWP Asst. National Coordinator, NES, MS. Pasua Carrutuens, Climate Change Officer, NES, and Mr. Daryl Rari, engineering technician, OMIA.

The Director of Environment gave a brief account of Department of Environment's functions and interests in relation to Water Safety Plans. He indicated that Water Safety Plans had some scope in the Cook Islands and informed the team that the National Environment Service had prepared a Catchment Management Plan for *Takuvaine* intake, which could be used as a model plan for the other 11 intakes. In addition, the IWP has completed several studies including a socio-economic survey, a legislative review and national cost for environmental pollution study. It was clear that there were some synergies between the work done by IWP and the planned WSP. It was agreed that IWP and the NES are key stakeholders and partners in the WSP programme. There was a recommendation from the Director of National Environment Services that the existing IWP National Task Force should become the WSP Steering Committee, but the Chairmanship transferred to Dept. of Water Works. Mr. Herman, on behalf of the Department of Water Works, agreed to the suggestion. Mr. Tupa indicated his support for the WSP project(s) and willingness to work with the DWW.

Mr. Otheniel informed the team that the major issue on outer islands was the decreasing water sources and deteriorating drinking water quality. He indicated his support for the WSP project(s) and expressed the need for similar project(s) in outer islands. He was willing to participate in the Steering Committee.

Both Mr. Tupa and Mr. Otheniel agreed to attend the round table discussions on Thursday 06th April 2006.

Tuesday 04 April 2006
1.30pm

The Team met with Mr. Vaine Teokotai, Permanent Secretary, Ministry of Health, Ms. Tae Noututai, Health Inspector and Mr. Tuaine Teokotai, Chief Environment Health Officer, MoH.

The Secretary for Ministry of Health was supportive of the WSP programme. He expressed his concern about the worsening state of drinking water quality, especially the impact on tourism. The MoH are aware and supportive of the work done by IWP and indicated that IWP could push the DWW to introduce some form of treatment (e.g. chlorination). He mentioned that under the 2004 Public Health Act, the Public Health Division is requesting on-site water treatment facility (e.g. filters) as a requirement for license for tourist accommodations and restaurants. Although he clearly expressed his lack of confidence in the DWW, Mr. Vaine Teokotai agreed to work with them to implement WSP project(s). He estimates that about 60% of the population in Rarotonga has installed some form of on-site water treatment. He recommended not using the word pilot when referring to WSP projects in the Cook Islands. He agreed to attend the Round table discussions on Thursday 06th April 2006.

3.00pm

The team toured the MoH Laboratory facilities and met with Ms. June Teiti, acting Lab Manager and Mr. Tangata Vaeau, Health Inspector, MoH. The laboratory setting was professional and well set-up. The team was informed that test results were considered confidential and with the exception of the Public Health Division, the data was not made public or shared with any other agencies (such as DWW and NES). This was due to the risk of sensationalized publicity by the media, which could result in a decline in tourism.

Wednesday 05 April 2006

9.00 am

The Team met with Mr. Iro Rangi, Mayor, Puaikura Vaka Council, Ms. Mele Raita, Mayor, Teau-o-tonga Vaka Council, Mr. Teariki Matenga, Mayor Takitumu Vaka Council and Ms. Vereara Taripo, President of CIANGO.

There is very strong community opposition to chlorination. The main reason for this opposition is the perception that chlorinated drinking water potentially causes coral reef damage. There are also some issues with palatability of chlorinated drinking water. The National Environment Service has a clause in the Environment Act, which regulates chlorine use in the country.

The three (3) district mayors made the following recommendations:

- Alternative forms of disinfection should be utilized by the DWW e.g. UV facility at schools
- Ensuring that donors respond to needed capital works should be an essential component of the Cook Is WSP project(s)
- Intakes need to be improved to ensure reliability of supply i.e. better quantity

All three (3) mayors agreed to attend the Round table meeting on Thursday 06th April 2006.

1.30pm

Presentations from Mr. Aporo Kirikava, I.T. Officer, MoW on mapping and GIS functions of DWW
Presentations from Ben Pakaroti on Aitutaki water mapping and related hydrogeology projects, 2004.

Thursday 6 April, 9-12 am

Roundtable Meeting with all stakeholders (see annex 3)

Ministry of Health Discussion:

Thursday 6/04/06 2.00 pm

A meeting was held at the Ministry of Health Headquarters with the Chief Health Inspector Mr. Tuaine Teokotai and Epii Nimerota in regards to the Water Safety Plans Programme. This was the second meeting with the MOH staff who may be directly involved in the risk assessment and management plans. The two staff was once again briefed on the WSP project and their expected roles. The chief Health Inspector informed that they did water sampling from the catchments and at the consumer end, and forwarded for bacteriological analysis at the hospital lab. The sampling intervals were about three months. He further added that about 70 % of the population used water which had received some sort of treatment. The requirement for the new building development is for the provision of wholesome water at the site. This is achieved by provision of water tanks or water treatment measures on site. The idea of purification of water by chlorination was supported by the Chief Health Inspector but he claimed that due to lack of sedimentation tanks there is high turbidity during heavy rains and the dirt also settles inside the distribution pipes. He agreed that the drinking water is grossly contaminated with harmful bacteria and chlorination may not be effective. Ms Epii Mimerota Health Inspector informed that there is one staff allocated for water sampling who is aware of the right sampling procedures. The Chief Health Inspector informed that he

does not submit the sampling results to Ministry of Works as they do not provide transport for water sampling. He claimed that Ministry of Works never follow the correct sampling procedures and use un-sterile coke bottles. Sampling forms, data sheets, results and a portable water sampling kit was also seen. Ms Nimerota assured me that she will provide the summarized sampling data for the last six months. It has been noted that there are sufficient resources at MOH for regular water sampling. The two staff was given the assessment forms and was requested to do a preliminary assessment on the Rarotonga water supply system. The staff was also provided with some H2S paper strip test bottles.

Ministry of Works Discussion:

Friday- 7/04/06 - 2.00 pm

A meeting was held with Mr. Adrian who is the lab technician of MoW in order to ascertain his lab capacity and analysis procedures. Mr. Adrian has no proper lab but uses an area shared with others at the water works building. Such facilities as sinks, shelves and confined area were lacking. Mr. Adrian has sufficient qualification from New Zealand and is capable of analyzing many parameters. He informed that Waterworks does bacterial analysis every three months and also does client job. His data revealed that there were very few bacterial samples done for the last few months. It was understandable that due to the lack of facilities vigorous analysis is impossible. Proper lab facilities are very much necessary in order to improve the situation. It was noted that proper sampling procedures were not followed as explained. Since there was insufficient sampling data Mr. Adrian assured me to send data collected by e-mail. Mr. Adrian showed me the sampling forms and record sheets. He informed that there are three labs, one at the hospital which did mostly clinical works and bacterial water analysis, second one at the Marine Dept which did analysis of ocean water. The third one is a small portable lab at the Dept of Environment. It is recommended that this lab be improved to cater for the necessary analysis of drinking water. Mr. Adrian was also provided with H2S paper strip test bottles.

Friday 7 April 9-11 am –

Wrap-up Meeting with MoW (see annex 3);

Field trip to inspect Tereora College water filtration/UV disinfection stations
Tereora College was visited by the team and accompanied by Mr Ben Parakoti. The Assistant principal showed us the UV disinfection units which was mounted on the wall of the school building and properly enclosed to protect from damage. The water from the mains supply passed through this unit before the drinking taps which were installed nearby. The principal also informed that the community members near by also used the tap water from the school for their use. The system unit was kept under lock and key.

4: CONCLUSION AND RECOMMENDATIONS

4:1 Conclusions

1. The Rarotonga water distribution pipe network rehabilitation programme has reduced leaks from 70%, nearer to the target of 20%. With rehabilitation about two-thirds complete, the DWW considers the time is right to shift focus from quantity to quality.
2. The International Waters Project (IWP) within the National Environment Service has completed important catchment wide pilot activities that should be captured and supported to continue with the proposed Cook Islands WSP project.
3. The National Task Force established by the IWP (due to conclude this year) has essentially the composition needed for the WSP Project Steering Committee. The Secretaries of Works, Environment and Health were quick to note the opportunity for transitioning the IWP Task Force into the WSP Steering Committee with Secretary of Works suggested by all as chair.
4. Inter-government agency cooperation is better between the Ministry of Works and the National Environment Service than either of these with the Ministry of Health. Cooperation among these three key agencies is essential for the WSP project. All three, plus the OMIA expressed interest and willingness to support a Cook Islands WSP Project.
5. Strong resistance to chlorination of the Rarotonga piped water supply was voiced by local government (all three mayors), government and non-government officials, with chlorine considered an undesirable additional chemical. This is very significant to consider in planning for safe, drinkable piped water on Rarotonga.
6. The Department of Water Works, had an unsuccessful trial with chlorination and have not been inclined to re-try chlorination in Rarotonga. In any case high turbidity 'chocolate water' which follows after heavy rainfall would defeat chlorine's ability to disinfect at the critical times.
7. Storage of water within the Rarotonga system, which could overcome the turbidity problem, is almost non-existent. Major capital works (storage, treatment or alternative sources) would be needed for Rarotonga water supply to significantly improve reliability and quality.
8. The interest and eventual commitment of Government to set a goal for safe, drinkable quality piped water (in addition to water quantity, the focus to date) for Rarotonga would be desirable. The proposed WSP project could reinforce and help justify infrastructure needs as well as ensuring basic operations as efficient as possible.
9. The MoW, NES and MoH each have water quality analysis capacity. None are very sophisticated; each use membrane filtration and incubation for 'total' or 'faecal' coliform counts.
10. High levels of total coliform counts are common in all analysis records for Rarotonga, often above 1000 cfu in source water and even in water piped to consumers. The MoH (hospital) lab appears best in terms of quality and capacity, but MoH is less willing to share results.

4:2 Recommendations

1. A Water Safety Plans (WSP) project for the Cook Islands should be formally requested by the Ministry of Works (MoW) through Foreign Affairs, the SOPAC National Focal Point. A letter to the Director of SOPAC should request Cook Islands to be included as one of four Pacific WSP pilot projects. The request should also refer to key partnerships agreed upon during the mission (see MoW 'Wrap-up Meeting', Annex 3).
2. Based on lessons learned through recent experiences, the proposed WSP Steering Committee should be a 'dove-tailed' continuation of the expiring IWP 'National Task Force'. A 'project management group' comprised of leaders of four 'working groups' will ensure inter-agency cooperation and that work is accomplished (see diagram, Annex 3).
3. The proposed Cook Islands WSP Project, Steering Committee, project design, training and planning workshop, etc developed with partners during the mission (under 'next steps' Annex 3) should be considered by the IWP and IWP Task Force as an opportunity for continuation and uptake of the drinking water quality aspects of their work.
4. Practical instructions and water and hygiene awareness tools for communities - such as rainwater catchment system care and management, household water treatment options, etc - should be an outcome of the WSP Project. 'Outer islands' applicability and use should be a prime consideration when developing these materials.
5. The MoW should liaise with the SOPAC/WHO- WSP Programme to fix the dates, programme, participant list and other details for the agreed four-day training and planning workshop. Dates in late July or mid August were suggested. The WSP Programme will then ensure financial support; facilitator(s) and expert(s) are available.
6. The MoW should provide the WSP Project with an inventory of existing research, studies, planning reports and other documents relevant to water quality in Cook Islands and Rarotonga. The WSP Project should make use of such existing research, knowledge and documentation.
7. The Cook Islands WSP project should plan an output to encourage the government of Cook Islands and relevant institutions to make a commitment to invest in safe, drinkable piped water for Rarotonga consumers as well as 'outer island' water supply systems.
8. The Ministry of Works water lab should be improved for the analysis of drinking water.

5: ACKNOWLEDGEMENTS

The kind cooperation of the staff of the Ministry of Works, the Ministry of Health and National Environment Service is greatly appreciated. In particular the mission team wishes to thank the Minister for Works Hon. Ngamau Munokoa, the Secretary for Works Mr Atatoa Herman, the Director for Water Works, Mr. Ben Parakoti, the Secretary for Health Mr Vaine Teokotai and the Director of Environment Service, Mr Vaitoti Tupa for their kind hospitality.

Programme**Annex: 1**

Date	Time	Activity	Venue
Monday 03 April 2006	AM	Met with Ministry of Works officials	Dept of Water Works Conference Room
	PM	Toured the Avatiu and Tupapa intakes	same
Tuesday 04 April 2006	AM	Met with officials from National Environment Service and Department of Island Administration (Prime Ministers Office)	same
	PM	Met with key officials from Ministry of Health	Public Health Conference Room
	PM	Toured the Ministry of Health Laboratory	Ministry of Health Laboratory
Wednesday 05 April 2006	AM	Met with officials from Cook Islands Association of Non Government Organization (CIANGO), other Non Government Organizations (NGOs) and District Mayors	Dept of Water Works Conference Room
	PM	Presentations from Dept of Water Works Officials on Ministry of Works Mapping and GIS capacity	same
	PM	Water Resource Management on Aitutaki Preparation for Round table meeting	same same
Thursday 06 April 2006	AM	Round table meeting	same
	PM	Met with National Environment Service (NES/IWP) and Ministry of Health counterparts for further discussions and exchange of information, resources and lessons learnt	National Environment Service
Friday 07 April 2006	AM	Wrap-up meeting with key officers from Ministry of Works and Dept of Water Works	Dept of Water Works Conference Room
	PM	Final review and write up recommendations	same

Persons Consulted:**Annex: 2**

Name	Position	Contact
<u>Ministry of Works</u>		
Hon. Ngamau Munokoa	Minister	
Mr. Ata Herman	Secretary	aherman@mow.gov.ck
<u>Department of Water Works</u>		
Mr. Ben Parakoti	Director	hydro@oyster.net.ck
Mr. Adrian Teotahi	Water Quality Specialist	hydro@mow.gov.ck
Mr. Paul Maoate	Asst. Engineer	
Mr. Timote Tangiruaine	IT Specialist	
Mr. George Cowan	Consultant	
Mr. Aporo Karikava	IT Officer	
<u>National Environment Service</u>		
Mr. Veitoti Tupa	Director	
Mr. Tauraki Raea	IWP National Coordinator	iwpcooks@environment.org.ck
Ms. Deyna Marsh	Asst. National Coordinator (IWP)	iwpcooks@environment.org.ck
Ms. Pasua Carrutuens	Climate Change Officer	
<u>Office for the Ministry of Island Administration</u>		
Mr. Otheniel Tangianau	Actg. CEO, OMIA	
Mr. Daryl Rari	Engineering Technician	
<u>Ministry of Health</u>		
Mr. Vaine Teokotai	Secretary of Health	v.teokotai@health.gov.ck
Mr. Tuaine Teokotai	Chief Env. Health Officer	t.teokotai@health.gov.ck
Ms. Tae Noututai	Env. Health Officer	
Mr. Tangata Vaeau	Env. Health Officer	
Ms. June Teiti	Actg. Laboratory Manager	
<u>Vaka Councils</u>		
Mr. Iro Rangi	Mayor, Puaikura Vaka Council	
Mr. Teariki Matenga	Mayor, Takitumu Vaka Council	kmatega@oyster.net.ck
Ms. Mele Raita	Mayor, Teau-o-tonga Vaka Council	

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