

**WATER SUPPLY AND SANITATION COLLABORATIVE COUNCIL
SMALL ISLAND DEVELOPING STATES (SIDS)
WORKING GROUP MEETING ON WATER**
held at the SOPAC Secretariat, Suva, Fiji, 7 February 1997

Ed Burke
SOPAC Secretariat

February 1997

SOPAC Miscellaneous Report 244

This meeting was sponsored by the Commonwealth Science Council

TABLE OF CONTENTS

	<i>Page</i>
INTRODUCTION	4
BACKGROUND.....	4
WATER SUPPLY AND SANITATION COLLABORATIVE COUNCIL (WSSCC)	4
SIDS WORKING GROUP	5
ISSUES FOR SMALL ISLAND STATES	5
CURRENT SIDS ACTIVITIES.....	6
<i>Small Island Global Activities</i>	6
<i>Small Island Regional Activities</i>	7
RECOMMENDATIONS FROM REGIONAL MEETINGS.....	8
DISCUSSION OF ISSUES.....	8
RESULTS OF DISCUSSION	8
OTHER WATER SECTOR ACTIVITIES.....	10
CLOSING	10
<u>ATTACHMENT 1</u>	11
<u>ATTACHMENT 2</u>	13
<u>ATTACHMENT 3</u>	18
<u>ATTACHMENT 4</u>	21
<u>ATTACHMENT 5</u>	24
<u>ATTACHMENT 6</u>	30

INTRODUCTION

This report documents the Water Supply and Sanitation Collaborative Council's Small Island Developing States (SIDS) Working Group Meeting on Water that was hosted by the SOPAC Secretariat on 7 February 1997. The SIDS meeting was held a day after the successful Small Islands Water Information Network (SIWIN) Workshop also held at the SOPAC Secretariat on 5-6 February 1997. Both the SIDS meeting and the SIWIN workshop were sponsored by the Commonwealth Science Council (CSC). British ODA and CSC funds were used to bring Commonwealth country participants to the two events. All other participants funded themselves.

The format of this report will follow the SIDS meeting agenda that appears in Attachment 1.

Dr Siyan Malomo from CSC chaired the meeting.

A list of participants appear in Attachment 2.

BACKGROUND

Water Supply and Sanitation Collaborative Council (WSSCC)

Attachment 3 gives details of the WSSCC. It's mission statement is to *“enhance collaboration among developing countries and external support agencies, so as to accelerate the achievement of sustainable water supplies, and waste management services for all people, with emphasis on the poor.”*

The Council has many existing working groups that are outlined in Attachment 3 that may be utilised by the SIDS group.

SIDS Working Group

At the Third Global Forum of the WSSCC held in Barbados from 30 October to 3 November 1995, Small Island States emerged as a group that needed to be dealt with specially. This resulted in the Council establishing a SIDS Working Group. Attachment 4 contains the results of the Small Island States Working Session of the Third Global Forum along with a SIDS Partnership Model indicating linkages between WSSCC, other working groups and the SIDS working group.

The recommended actions of the Working Session were to:

- establish a SIDS working group under WSSCC;
- structure a small Core Group and network of contacts; whose
- Terms of reference was to include establishing a relevant information data bank and register of SIDS contacts, organising appropriate working relationships and developing a prioritised work programme.

Representing the Pacific Region at the Working Session were:

- Alf Simpson, SOPAC
- Peter Cox, Western Samoa Water Authority
- Amo Mark, The Water Board, PNG
- Ed Burke, SOPAC

Issues for Small Island States

The following issues were presented at the Suva meeting:

- Pressure for Economic Development:
(tourism, industry, agriculture, forestry, mining)
- Employment Generation:
(better health for employment and development)
- Health:
(better health for employment and development)

- High Population Growth:
(increased pressure on small atolls and coastal areas)
- Inadequate trained manpower:
(no technical or professional capacity)
- Environmental Concerns:
(limited water resources, diminishing water quality, increasing coastal erosion, uncontrolled deforestation, poor waste disposal, inadequate coastal protection)
- Global Warming/Sea Level Rise
(Beyond the control of the SIDS but the people of the small islands would more likely drown in their own waste long before they drown by rising seas)

Water and sanitation are basic to all the above issues. Economic development requires water and with development comes employment and improved health conditions through better water supply and sanitation facilities. Small island environments must be managed to ensure sustainable development of natural resources especially water and the control of pollution.

Current SIDS Activities

The following is a list of SIDS activities either completed or planned by SOPAC's Pacific Water and Sanitation Program (WASP): (Note that WASP was funded by UNDP during 1995 and 1996)

Small Island Global Activities

- Workshop on Technologies for Maximising and Augmenting Freshwater Resources in Small Islands, Suva, Fiji, February 1996.
- Produced Source Book on Technologies for Maximising and Augmenting Freshwater Resources in Small Island Developing States for UNEP.
- UNESCO/SOPAC Groundwater Pollution Study in Tonga including two on-the-job training fellowships.

- UNESCO/SOPAC Groundwater Recharge Study in Kiribati including two on-the-job training fellowships.
- Workshop on Appropriate and Affordable Sanitation for Small Island States, Kiribati, August 1996, out of which a guidelines booklet will be produced.
- Working with Commonwealth Science Council through Dr Malomo to develop a Small island Water Information Network. (ie SIWIN Workshop, Suva, Fiji, 5-6 February 1997).

Small Island Regional Activities

- Establishment of Pacific Water Association (an association of island waters and wastewater utilities plus allied members).
- Water sector training of island nationals - Earth Science and Marine Geology Course plus fellowships.
- Coordination of Pacific regional participation in the ADB Workshop on Water Resources Development and Management, Manila, May 1996.
- Hosted working group meeting of UNESCO International Hydrological Programme in Suva, Fiji, April 1996.

Planned Activities

- Solar Pumping Workshop scheduled for early 1997 in Fiji.
- Produce and distribute Guidelines on Appropriate Sanitation for Small Islands.
- Comments on Waterless Composting Toilets.
- Leak Detection Workshop (donor required).
- Groundwater Drilling Operators Training Workshop (donor required).
- Regional technical support

RECOMMENDATIONS FROM REGIONAL MEETINGS

Attachment 5 contains recommendations regarding small island water and sanitation related issues from the following meetings:

- UNEP-sponsored Workshop on Technologies for Maximising and Augmenting Freshwater Resources in Small Islands (South Pacific, Indian Ocean and South China Sea Regions) 6-8 February 1996 in Suva, Fiji.
- UNESCO International Hydrological Programme Pacific Working Group Meeting 22-24 April 1996 in Suva, Fiji.

Recommendations from the above meetings were presented to the participants of the SIDS meeting to advise them on what has been previously decided at other water sector venues.

DISCUSSION OF ISSUES

Each country representative stated their perceived water sector issues giving priority to one issue. Attachment 6 lists the issues for each country.

It was noted that the most of issues raised echoed those made in chapter 18 of Agenda 21 and reinforced at the UN Global Conference on the Sustainable Development of Small Island Developing States held in Barbados, 1994.

RESULTS OF DISCUSSION

Country priorities are summarised below:

1. Institutional Strengthening

- infrastructure
- management
- maintenance

2. Capacity Building

- maintenance
- leak detection
- legislation

3. Affordable Alternative Technologies

4. Wastewater Management and Sanitation

5. Regional Collaboration

- maintenance
- “buddy” system (reciprocating country assistance)
- Pacific Water Association

These water sector issues are well known in the Pacific. The problem is how to deal with them. Removing these bottle necks would assist with economic development, job creation and all round better health.

It was decided at the meeting to prepare a Working Group report reiterating SIDS water and sanitation issues, develop an action plan and report back to the WSSCC, at its scheduled November 1997 meeting in Manila, seeking bilateral as well as regional support from donors.

Participants strongly suggested that SOPAC draft the report for a SIDS representative/delegation to present at the WSSCC meeting. SOPAC is willing to assist in drafting the SIDS report but would require additional resources due to the lack of major donor funding for its Pacific Water and Sanitation Program.

Note that this Working Group has implemented most of the actions recommended by the Barbados SIDS Working Session (see SIDS Working Group section of this report). The SIDS Working Group has been established with a small Core Group.

SIWIN will establish a relevant information base with a register of contacts. What is now required is to interact with existing WSSCC Working Groups and develop a prioritised work plan.

OTHER WATER SECTOR ACTIVITIES

It was brought to the attention of the meeting participants that there is a good possibility of GEF funds being available for integrated freshwater basin-coastal areas management in SIDS. However to access this possible source of funding individual countries must initially write to the following address requesting assistance with integrated freshwater-coastal management:

Mr. A. Djoghla
Executive Coordinator
GEF Coordinating Unit
Box 30552
Nairobi.

CLOSING

The meeting was closed by the Chairman.

ATTACHMENT 1

WSSCC/SIDS Meeting Agenda

**WATER SUPPLY & SANITATION COLLABORATION COUNCIL
SMALL ISLANDS DEVELOPMENT STATES (SIDS) WORKING GROUP**

Held at the SOPAC Secretariat on Friday 7 February 1997

AGENDA

1. Background
2. Recommendations from Regional Water Meetings
3. Discussion of Issues
4. Results of Discussion
5. Other Water Sector Activities
6. Closing

ATTACHMENT 2

PARTICIPANTS LIST

PARTICIPANTS LIST

**Water Supply and Sanitation Collaborative
Small Island Working Group Meeting on Water
held at the SOPAC Secretariat, Suva, Fiji
7 February 1997**

Cook Islands

Mr. Ben Parakoti
Director of Water Works
Ministry of Works, Environment
and Physical Planning
Cook Islands

Tel: (682) 20 034
Fax: (682) 21 134

Kiribati

Mr Taboia Metutera
Water & Sewerage Engineer
Public Utilities Board
PO Box 443
Betio, Tarawa
Kiribati

Tel: (686) 26292
Fax: (686) 26106

Niue

Mr. Clinton Chapman
Manager
Water Supply Division
Public Works Department
P O Box 38
Fonuaakula
Niue

Tel: (683) 4297
Fax: (683) 4223

Papua New Guinea

Ms. Elizabeth Michael
Hydrogeologist
Dept. of Mining & Petroleum
Private Mail Bag
Port Moresby Post Office
P.N.G.

Tel: (675) 3 212422
Fax: (675) 3 211360

Solomon Islands

Mr. Isaac Lekelalu
Acting Chief Water Resources Officer
Ministry of Energy, Water &
Mineral Resources
P.O. Box G37
Honiara
Solomon Islands

Tel: (677) 21521
Fax: (677) 25811

Tonga

Mr. Saimone Helu
General Manager
Tonga Water Board
P.O. Box 92
Nuku'alofa
Tonga

Tel: (676) 23299
Fax: (676) 23518

Tuvalu

Mr. Filipo Taulima
Director of Works
Public Works Department
Private Mail Bag
Funafuti, Tuvalu

Tel: (688) 20300
Fax: (688) 20301

Vanuatu

Mr. Stanley Temakon
Director
Department of Geology, Mines and
Water Resources
Private Mail Bag 001
Port Vila
Vanuatu

Tel: (678) 22423
Fax: (678) 22213
Email: [geomines@ Pactok.peg.apc.org](mailto:geomines@Pactok.peg.apc.org)

Western Samoa

Mr. Latu Kupa
General Manager
Western Samoa Water Authority
P.O. Box 245
Apia
Western Samoa

Tel: (685) 20409
Fax: (685) 21298

Mr. Amataga Penaia
Scientific Officer - Hydrology
Apia Observatory
P.O. Box 3020
Apia
W. Samoa

Tel.: (685) 20855/50
Fax: (685) 20857

American Samoa

Capt. Michael Dworsky
Sanitary Engineer
American Samoa Power Authority
P.O. Box PPB
Pago Pago, AS 96799

Tel: (684) 633 5200
Fax: (684) 633 5451
Email: Sewer@Satala.aspower.com

Fiji

Prem Kumar
Principal Geologist
Mineral Resources Department
Private Mail Bag
Suva

Tel: (679) 381611
Fax: (679) 370039
Email: prem@mrd.gov.fj

Malakai Finau

Hydrogeologist
Mineral Resources Department
Private Mail Bag
Suva

Tel: (679) 381611
Fax: (679) 370039
Email: mala@mrd.gov.fj

SPREP

Mr. Andrew J. Munro
Waste Management & Pollution
Prevention Officer
SPREP
PO Box 240
Apia
Western Samoa

Tel: (685) 21929
Fax: (685) 20231
Email: sprep@talofa.net

UNDP

Hideko Matsuo
UNV Programme Officer
UNDP
Private Mail Bag
Suva
Fiji

Tel: (679) 312500
Fax: (679) 301718

University of Hawaii

Phil Moravick
Water Resources Research Centre
University of Hawaii @ Manoa
Hawaii

Tel: (1 808) 956 3097
Fax: (1 808) 956 5044
Email: <morav@hawaii.edu>
<http://www2.hawaii.edu/morav/WRRC.html>

BGS

Andrew McKenzie
Hydrogeology Group
Maclean Building
Wellingford
Oxfordshire OX10 8BB
United Kingdom

Tel: (44 0) 1491 69 2295
Fax: (44 0) 1491 69 2345
Email: A.McKenzie@bgs.ac.uk

CSC

Siyan Malomo
Commonwealth Science Council
Marlborough House
Pall Mall
London SW1Y 5HX
United Kingdom

Tel: (44) 171 747 6211
Fax: (44) 171 839 6174
Email: malomo@comsec.tcom.co.uk
Email: comsci@gn.apc.org

SOPAC Secretariat

Private Mail Bag GPO
Suva Fiji

<http://www.sopac.org.fj/index.html>

Ed Burke
Project Manager

Email: ed@sopac.org.fj

Alf Simpson
Deputy Director

Email: alf@sopac.org.fj

Giovanni Ricci
Associate Expert

Email: giovanni@sopac.org,fj

Anna Elaise
Project Assistant

Email: anna@sopac.org

ATTACHMENT 3

**WATER SUPPLY AND SANITATION COLLABORATIVE COUNCIL
(WSSCC)**



The Water Supply and Sanitation Collaborative Council

The Water Supply and Sanitation Collaborative Council was formed at the end of the United Nations International Drinking Water and Sanitation Decade (1981-1990) to provide a framework for collaboration between sector agencies in both developed and developing countries.

Mission

The Mission of the Collaborative Council is

To enhance collaboration among developing countries and External Support Agencies so as to accelerate the achievement of sustainable water, sanitation, and waste management, with special attention to the poor.

Functions

The Council provides a forum for the discussion of key issues, alerts members to opportunities for more efficient use of resources, increases awareness of the need to expand water, sanitation and waste management coverage, promotes collaboration at the country level, and stimulates the adoption of harmonious policies and programmes.

The Council meets in a Global Forum once every two years. The next Global Forum will be held in Manila, Philippines, in November 1997.

In between the Global Forums, the Council operates through a number of Working Groups, Networks and Task Forces dealing with specific issues, topics and tasks concerned with improving water supply and sanitation provision in developing countries and countries of the former Soviet Union.

Working Groups

1. Country Level Collaboration and National Sector Strategies. *Coordinator:* United Nations Children's Fund (UNICEF)
2. Community Management and Partnerships with Civil Society. *Coordinator:* International Secretariat for Water (ISW).
3. Promotion of Sanitation. *Coordinator:* World Health Organization (WHO)
4. Water Supply and Sanitation Development in Africa. *Coordinator:* Nigeria
5. Water Demand Management and Conservation. *Coordinator:* Trinidad
6. Advocacy and Communication Strategies. *Coordinator:* IRC International Water and Sanitation Centre
7. Water Supply and Sanitation Issues in Small Island States. *Coordinator:* Western Samoa
8. Water Supply and Sanitation Issues in Central and Eastern Europe and the Commonwealth of Independent States. *Coordinator:* Mountain Unlimited
9. Institutional and Management Options including Decentralization. *Coordinator:* United Nations

Development Programme (UNDP)

10 The Lusophone Initiative. *Coordinator:* Angola

Networks

1. Services for the Urban Poor. *Coordinator:* United Nations Centre for Human Settlements (Habitat)
2. Operation and Maintenance. *Coordinator:* World Health Organization (WHO)
3. Global Applied Research Network. *Coordinator:* Water, Engineering and Development Centre (WEDC)
4. Gender Issues. *Coordinator:* PROWESS and World Bank

Task Forces

1. Documentation and Dissemination. *Coordinator:* International Association for Water Quality (IAWQ)
2. INTERWATER. *Coordinator:* IRC International Water and Sanitation Centre
3. Human Resources, Development, Training and Education (HRD). *Coordinator:* United Nations Development Programme (UNDP)
4. Emergency Measures in the Water Supply and Sanitation Sector. *Coordinator:* United Nations Children's Fund (UNICEF)

Further information on the Water Supply and Sanitation Collaborative Council and its activities is available from:

Mr. Ranjith Wirasinha, Executive Secretary, Water Supply and Sanitation Collaborative Council c/o World Health Organization Avenue Appia 20 CH-1211 Geneva 27, Switzerland. Tel: +41 22791 3685. Fax: +41 227880054. E-mail: wirasinhar@who.ch



IRC Home Page
[About IRC and its partners](#)
[What's New at IRC?](#)

Who's who at IRC
[Advisory services](#)
[Documentation services](#)

Publications
[Research](#)
[Training](#)



ATTACHMENT 4

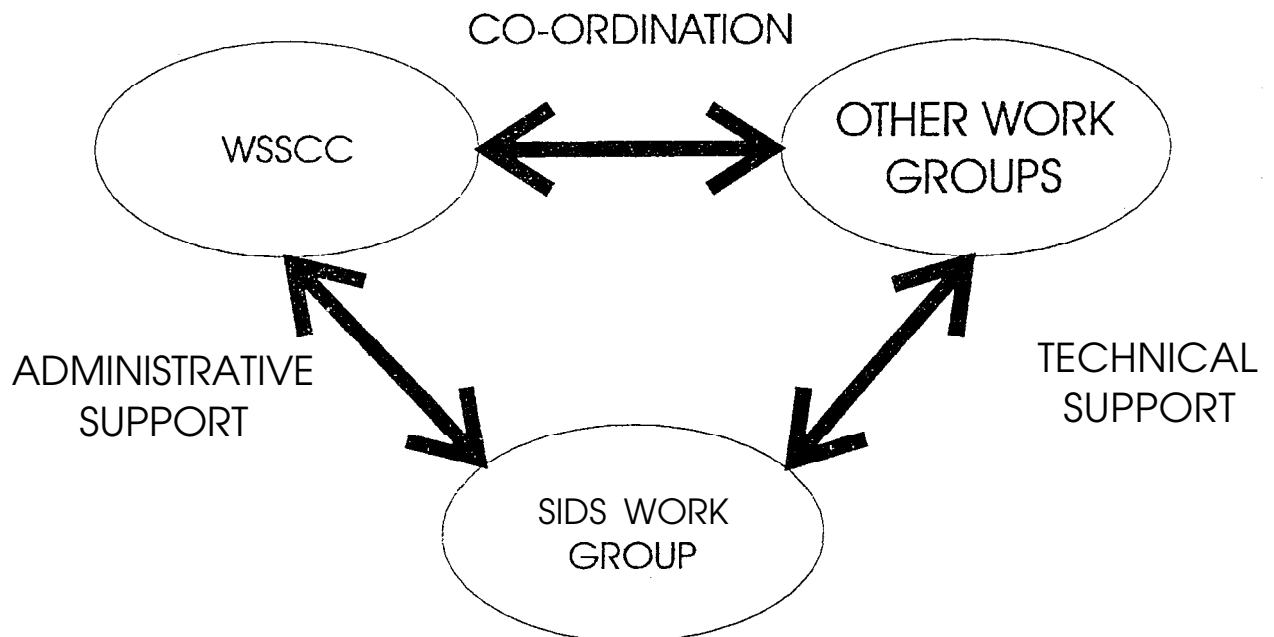
**SMALL ISLAND STATES WORKING SESSION OF THE THIRD GLOBAL
FORUM**

And

SIDS PARTNERSHIP MODEL

SIDS

PARTNERSHIP MODEL



Barbados Global Forum

Report of Working Session Discussions on:

SMALL ISLAND STATES

SESSIONS

I.2 & II.6

1. Summary of current situation

- Fragile, vulnerable, limited resources
- Lack of directly applicable research
- Isolated in terms of access to information and appropriate expertise
- Diminishing priority in terms of aid
- Available technology not generally applicable

2. Barriers to achievement

- Inappropriate training strategies
- Limited access to information
- Fragmentation - weak global voice and lack of self help opportunities
- Lack of integrated sector planning (orange/onion planning)
- Dysfunctional community/political attitudes

3. Recommended Actions

- Establish a SIDS working group under WSSCC
- Structure a small Core Group and network of contacts
- Terms of reference to include establishing a relevant information data bank and register of SIDS contacts, organizing appropriate working relationships and developing a prioritized work programme

4. Gender implications of recommendations

relationship to be established between the SIDS Working Group and the proposed network 01 Gender Issues

5. Implications for other Council Working Groups

Other working groups to consider small island issues related to their particular area and establish linkage to SIDS.

ATTACHMENT 5

RECOMMENDATIONS FROM REGIONAL WATER MEETINGS

CONCLUSIONS & RECOMMENDATIONS

From the Report on the Workshop on Technologies for Maximising and Augmenting Freshwater Resources in Small Islands (South Pacific, Indian Ocean and South China Sea Region)

Differences in the small islands are due to a variety of factors including:

- physical factors (size, topography, geology, location and climate);
- economic factors (resource base, level of development including industry, tourism and agriculture);
- political factors (some islands are part of independent small island states while others are part of larger archipelagos or continental countries);
- demography (population density and distribution);
- social and cultural factors (level of skills amongst the workforce, local customs)

It was further recognised that a number of problems that affect small islands causes difficulties in making assessments development and management of freshwater resources

These problems include:

- often very limited resources including freshwater resources
- isolation and the difficulty of travel and communications
- fragile ecosystems
- extreme exposure and vulnerability to natural disasters (including cyclones/typhoons, earthquakes, tsunamis, droughts, floods and the threat of rising sea level
- often a shortage of trained staff in the water sector

CONCLUSIONS

There are a number of successful and widely used technologies which are applicable to small islands, depending on the circumstances. It was recognised that some technologies are applicable in particular island environments but not in others. There is a real need to learn from each other's experience, in order that the technologies that have been found successful can be appropriately applied in similar island environments.

Examples are:

- high volcanic islands with groundwater and surface water:
 - vertical boreholes (drilled wells)
 - stream bed collector systems
- coral islands (particularly atolls):
 - rainwater collection systems
 - dug wells for small scale systems
 - infiltration galleries to maximise usage from available groundwater

RECOMMENDATIONS

The following specific recommendations were made:

- in general, island countries should concentrate on the rational and systematic assessment, development and management of naturally occurring freshwater resources (such as groundwater, rainwater catchments and surface water) before other more expensive and complex technologies are planned or introduced.
- the enactment and enforcement of appropriate water resources and environmental legislation is supported and encouraged to protect, conserve and manage any island's water resources and associated fragile ecosystems.
- conjunctive use of different sources of water is encouraged to optimise the use of freshwater (e.g. combined use of rainwater and groundwater).
- continuous and thorough review of established technologies and practices is required to allow practical application of appropriate alternatives.
- community consultation and participation in water development and management is essential.
- continual demand management measures are required in order to maximise the potential from existing developed water sources. Such measures can include leakage detection, minimisation of other unaccounted-for water, water saving devices, public education and awareness campaigns regarding water conservation and pricing policy.
- water and sanitation should be considered in an integrated fashion, including consideration of alternative systems which act to conserve water and minimise pollution of soil and water (e.g. composting toilets). This is a particularly relevant issue in the small coral islands.
- adequate monitoring systems (for example, climate, hydrology, hydrogeology, flow rates, water quality) are essential to properly evaluate the behaviour of fragile island water resources and water development systems utilising these resources.
- inter-sectoral involvement in relation to water management issues (for example, integrated catchment management involving water resources, land management and agriculture agencies and community representatives) is required.
- research is required in the following areas:
 - rainwater catchments (water quantity and quality) so as to refine analysis and design procedures. This would allow appropriate definition of design parameters such as length of rainfall record, time resolution of rainfall data, runoff coefficient. The research could involve instrumentation of a rainwater system or systems with automatic raingauge, meter on outflow and water level recorder in tank

- effective methods of community consultation and participation in water resource management
further analysis of groundwater recharge in island
- environments (noting the current UNESCO/SOPAC project on the island of Tarawa, Republic of Kiribati)
- further research into groundwater contamination
(noting the current UNESCO/SOPAC project on the island of Lifuka, Kingdom of Tonga)
- dissemination of information from sources within and outside the region is required particularly in the following areas:
 - ferrocement tanks
 - other materials for rainwater tanks that are suitable from a structural, economic, water quality and durability viewpoint
 - composting toilets
 - solar energy
- linkages between existing regional, international and local organisations are encouraged to assist with information exchange and technology transfer. Such organisations include but are not limited to the following:
 - UNEP
 - (SOPAC)
 - the sub group of the International Water Supply Association (IWSA) within the Indian Ocean
 - (UNESCO)
 - universities and research organisations working in the field of island water and sanitation issues
 - water sector utilities and other water agencies within the islands of the Region
 - UNICEF
 - WHO
 - UNDP
 - Water Supply and Sanitation Collaborative Council
 - UNDP/World Bank Water and Sanitation Program
 - Commonwealth Science Council
 - British Geological Survey
 - University of Hawaii - WRRC
 - University of Guam - WERI

UNESCO IHP WORKING GROUP MEETING

RECOMMENDATIONS ON
HYDROLOGY AND CLIMATE

CORAL ISLAND GROUNDWATER FLOW PROJECT

- analysis of existing data
- application of available models and testing
- evaluation of appropriate models
- training in the use of models and data
- publication of report
- dissemination of results

RAINWATER CATCHMENT STUDY
(W Samoa, Kiribati, Fiji, Lau Group, Tuvalu)

Aim

To provide input data for design - simulation model

- instrument a number of roof catchments with rain gauge, flow meter on outlet and overflow water level recorder in tank
- calculate losses due to gutter, overflow
- report, disseminate

CONDUCT COMPOST TOILET TRIAL ENVIRONMENT FOR THE REGION
(Include Low Cost Sewerage Systems)

In Collaboration with SOPAC, SPREP, WHO, SPC and UNICEF

- Start with baseline data on water pollution that may be caused by current sanitation techniques
- Establish and determine common enteric illness in community
- Householder and community involvement in design construction and monitoring of toilets (SOPAC Workshop) range of socio-economic status

- Assessment of householder acceptance, biological process impact on environment (including reduction of water pollution)
- Impact on public health (any reduction in incidence of enteric disease)
- evaluate fertilizer value of compost in specific soil conditions of project site

ATTACHMENT 6

COUNTRY WATER SECTOR ISSUES

1 □ Issues - Western Samoa

- Priority - look into the value of water, costs and tariffs
 - Sharing of skills

2 □ Issues - American Samoa

- Strengthening institutional infrastructure for managing water and waste water

3 Issues - Solomon Islands

- Priority - Water legislation, including protection zones, catchment management
 - Groundwater development an important issue
 - Training in water well drilling, water well design
 - Exploitation of freshwater lenses

Issues - PNG

- Priority - Institutional strengthening, country level collaboration + info management
 - Village water supplies

Issues - Cook Islands

- Priority - Strengthening of management and water facilities
 - Lack of resources - \$- lack of trained staff
 - Double water by year 2000 ? increase storage
 - Need management for 5 year master plan/ network analysis
 - Examine groundwater resource/ alternatives for agriculture
 - Gw quality vs waste disposal
 - Leak detection - what's needed/ training
 - Shallow well rehabilitation
 - Quality measurement
 - PR

Issues - Kiribati

- Priority - Limited water resources. Desalination (in the future)
 - Demand management
 - Spare part availability
 - Capacity building

Issues - Hawaii

- Priority - Education of government
 - Contamination, stream water quality, surface water quality
 - Research on roof rainwater catchments
 - Research into desalination

8 Issues - Vanuatu

- Priority - Maintenance of rural water supply systems - A social rather than a technological issue
- Second priority - Legislation, land ownership, water rights
 - Needs - Issues of appropriate technology

- Small scale pumping systems, who is manufacturing, what works?
- Experience in hydrological hydroecological baseline data
- Case studies on sewage systems, reticulated or better options?
- Natural water quality linkages to health

9 Issues - Tonga

- Priority - Development of affordable alternative water supplies

10 Issues - Tuvalu

- Priority - Inadequate water storage

11 Issues - Niue

- Priority - Capacity building

12 Issues - Fiji

- Priority - Water resources management
 - Human resources development

13 Issues - Regional & User perspective

- Development; industry and tourism require reliable water (& utilities)
- True user costs
- Quantifying resource for planning
- Waste water management