

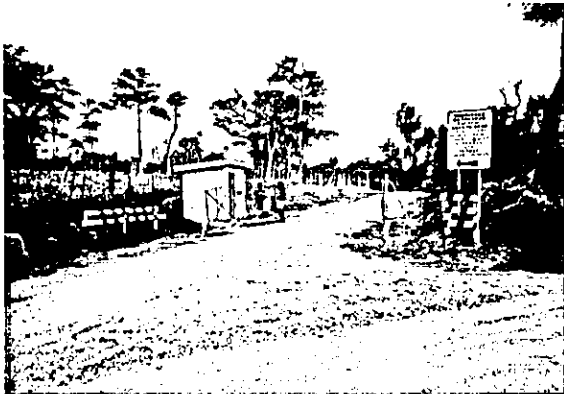
APPENDIX F
PHOTOGRAPHS
EXISTING WASTE MANAGEMENT SITUATION

Cook Islands
Rarotonga



Nikao waste depot - Active landfilling area

Vanuatu
Bouffa Waste Depot, Port Vila



Entrance to waste depot

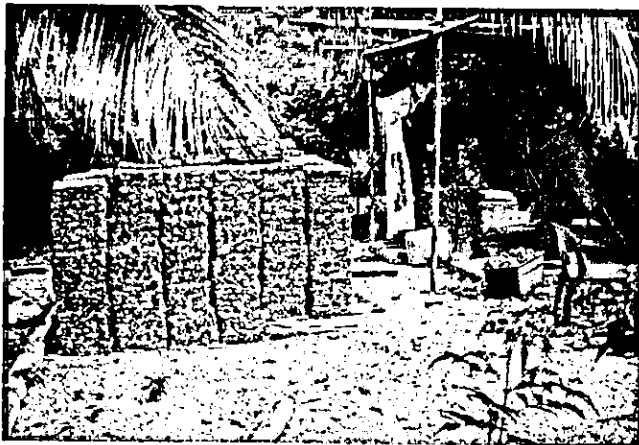


Access road to active tipping area

Kiribati
South Tarawa



Aluminium can recycling



Crushed aluminium cans in the same facility.

Betio Waste Disposal Site



High organic proportion in the waste



Federated States of Micronesia



Kolonia Waste Depot, Pohnpei

Republic of Marshall Islands
Majuro Atoll

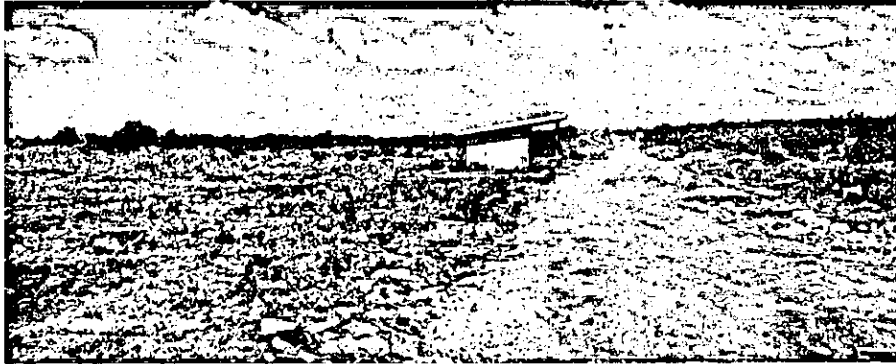


Old waste disposal area



Active waste disposal area

Tonga
Nuku'alofa, Tongatapu



Tukutonga dump site



Sludge disposal facilities
at Tukutonga dump site



Samoa
Apia, Upolu

Entrance and gatehouse to
Tafa'igata Waste Depot



Access road to active
tipping area



Active tipping area

Fiji
Lami Waste Depot, Suva

Site office / gate house

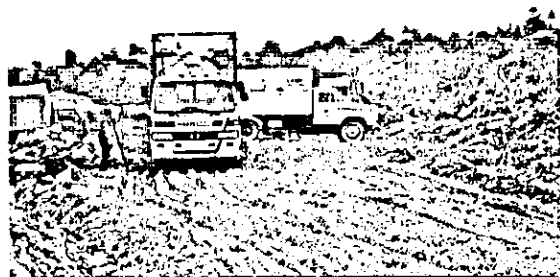


Vehicle wash down area



Filled area (not active – no cover)

Active tipping area





Leachate / stormwater drainage.

Lautoka Waste Depot

Gate house / entrance



Main active tipping area



Second active tipping area (on road)

APPENDIX G
REPORT ON ACTIVITIES OF
DONORS, REGIONAL AND INTERNATIONAL ORGANISATIONS

JAPAN INTERNATIONAL COOPERATION AGENCY

GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT IN PACIFIC ISLAND COUNTRIES

REPORT ON MEETING WITH AID AGENCY / REGIONAL / INTERNATIONAL ORGANISATION

JICA : Samoa

1. JICA

The Japan International Cooperation Agency (JICA), Samoa office has responsibility for the Pacific Island countries of Samoa (western), Cook Islands and Niue.

1.1 ACTIVITIES IN THE REGION

JICA undertook a limited number of activities in the Samoa region in the past with respect to waste management. JICA has recently commenced an association with the South Pacific Regional Environment Programme (SPREP) activities and provide funding to this body.

Some of the activities undertaken by JICA include:

- Providing volunteers who have worked with Samoa in the waste area. There are currently more than 30 volunteers with some working in agriculture and are involved in promoting composting.
- Placing a waste management expert to SPREP to provide assistance at a regional level.
- Undertook a training course for South Pacific Forum countries in Okinawa in January 2001. This was run/organised by Dr. K. Sakurai, the University of Okinawa. The training course mainly focused on municipal solid waste management and covered such subjects as compost making, waste characterisation studies and included visits to waste facilities. Some NGOs in Okinawa were involved in assisting the training.
- Currently considering the provision of a waste incinerator for medical waste in response to the request by DOH however JICA have a number of concerns with the proposal with respect to management of waste, operation and maintenance of equipment
- A grant was given to the Flower Growers Association, which was used to purchase equipment (chipper etc.) for use in composting. The composting operation uses garden waste and brewery and products are used to grow plants and flowers
- Provided small incinerators jointly with WHO and UNICEF for healthcare waste to Kiribati, Vanuatu, Solomon Islands and FSM

Some of the activities to be undertaken in the near future include:

- A waste management workshop in March 2002 which will be attended by representatives from a number of South Pacific Forum countries. This will follow on from previous training course and aims to be practical.
- Construction of SPREP Training and Education Centre to commence operation in February 2002.

- Placement of a volunteer with the DEC from April who will be working on the area of solid waste management.

1.2 PROJECT SUSTAINABILITY – ECONOMIC

JICA, Samoa has encountered a number of economic project sustainability issues including the issue of asset maintenance. Asset maintenance is seen to vary a lot (between governments and government departments) with some donated equipment well looked after and some not so well. JICA sees this as an issue of inadequate training rather than more specifically a cost issue. The importance of training when an asset is provided has been recognised and JICA now typically bring out an expert to train staff in asset maintenance when projects are undertaken.

1.3 INSTITUTIONAL BARRIERS

JICA, Samoa recognises that there are often a number of institutional barriers associated with the effectiveness of aid donations. With respect to the area of waste management, it is generally acknowledged that the current staff within the Division of Environment and Conservation (DEC are the government division responsible for the Tafaigata dump site and waste services) are generally well educated. It is however noted that the division lacks resources (both staff numbers and funding) and may also lack practical experience and experience in the implementation of projects.

Based on the structure and operation of the Samoan government, JICA has found that the previous placement of the JICA volunteer with the DEC was not as effective as desired.

JICA has noted that the volunteer placed with the DEC identified a number of prospective projects for improvements of waste management but these have not yet been undertaken by the Samoan government.

1.4 PROJECT SUSTAINABILITY / ENVIRONMENTAL AND SAFETY STANDARD

One of the recommendations, from work undertaken by JICA, was to place an incinerator at the landfill site. This project did not progress, as the Japanese government was deeply concerned about a controversial issue of application of environmental standards versus economic sustainability. The concern was that Japanese environmental standards would not apply to the incinerator. Application of environmental standards from industrialised countries would necessitate extensive pollution control equipment and hence the cost of such a facility would be prohibitively expensive to a recipient country.

JICA generally applies Japanese health and safety standards to all of its aid projects.

1.5 CONTACT DETAILS

Name: Mr Satoru Mimura
Organisation: JICA, Samoa Office
Email: mimura@jica.go.jp
Date met: 14 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON MEETING WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

JICA – Fiji Office

2. JICA

The Japan International Cooperation Agency (JICA), Fiji office includes responsibility for nine countries including the countries of FSM (Federated States of Micronesia), Fiji, Kiribati, Marshall's, Nauru, Palau, Tonga, Tuvalu, Vanuatu.

2.1 ACTIVITIES IN THE REGION

JICA, Fiji office undertakes a wide range of projects in this region (including in the areas of fisheries, health and education) although it does not undertake many activities with respect to waste management. JICA have sent a volunteer (JOCV) to work with the Fiji Department of Environment (DOE), Fiji but this was generally to assist with environmental education.

JICA are currently considering the funding of an incinerator for medical waste in the western region of Fiji (Nadi Lautoka). This is being done through the Ministry of Health. At present medical waste is landfilled. The decision as to whether it is better to incinerate or dump in a landfill is a balancing act as to which has the least impact (ie. Incinerators contribute to poor air quality but landfilling is more of a health risk).

2.2 PROJECT SUSTAINABILITY – ECONOMIC

With respect to ongoing project sustainability (following the provision of aid monies), JICA recognise that the Fiji government generally do allocate a certain amount of money for equipment maintenance although this not usually enough. In general the Fiji government seems to be better at this than other Pacific governments.

2.3 INSTITUTIONAL BARRIERS

JICA, Fiji recognise that there are difficulties with current institutional arrangements (eg. Fiji DOE only has a very small staff number although the staff are very capable).

Other institutional/other types of barriers are evidenced by the slow approval for the new landfill outside Suva. This is apparently due to the issue of Fijian landowners trying to claim money for use of the land.

2.4 PROJECT SUSTAINABILITY / ENVIRONMENTAL AND SAFETY STANDARD

JICA, Fiji does not generally apply Japanese environmental standards to projects. For example, the four new incinerators, one at each of the sub-regional hospitals will not meet Japanese standards (note - the three main hospitals already have incinerators). They are seeking quotes from Australia for the supply of these incinerators. They have not specified standards to be met, as, if they did, they believe that the project would not happen. In general JICA projects do not go through an Environmental Officer or EIA type of process. The incinerators are not considered big (not a Grant Aid project) so don't go through environmental approval/Japanese government approval process.

2.5 OTHER COMMENTS

JICA have found that there is a lot of staff turnover within government departments. JICA do follow up on former participants and have found that in recent years there hasn't been such a high staff turnover. A Japanese audit undertaken in the last 3 years found that of the 300 employees who were trained, about 10% had moved on to new positions.

2.6 CONTACT DETAILS

Name: Mr Tadanori Suzuki / Mr Hiroyuki Sawada

Organisation: JICA

Email: jica@is.com.fj

Date met: 19 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON MEETING WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

AusAID : Samoa

3. AUSAID

3.1 ACTIVITIES IN THE REGION

AusAID is the Australian government's overseas aid program.

The AusAID, Samoa office is not currently undertaking any projects with respect to solid waste site management. Activities undertaken by AusAID in Samoa relating to waste management are the hazardous waste workshop which was funded by AusAID (undertaken by Golders) and the work on the POPs through the South Pacific Regional Environment Programme (SPREP).

Outside of waste management projects, AusAID have been doing a lot of work with respect to Public sector reform and believes that the time is ripe for changes. This is a major project and crosses all government departments.

3.2 PROJECT SUSTAINABILITY – ECONOMIC

AusAID, Samoa recognise that there are a number of problems associated with ensuring project sustainability. Often not enough consideration is given to issues of planning and maintenance in undertaking a project and therefore no allowance is made (in government budgeting) for equipment replacement.

The recent introduction of water meters in Samoa had a major adverse reaction. AusAID suggested that a similar reaction may result if charges were introduced for waste services.

3.3 INSTITUTIONAL BARRIERS

AusAID noted that Samoans were a highly mobile population particularly between Samoa and countries such as New Zealand. This resulted in high staff turnover / movements and the resulting institutional difficulties that this created.

AusAID indicated that the Samoan Government has a highly centralised HR system which could (in AusAID's view) be devolved to government departments to provide them with greater responsibility. This is the key thinking behind AusAID's project into public sector reform. The public sector is currently paid well below what the private sector is paid and consequently there is a major problem in trying to retain staff. This is not happening in the treasury department, where they are paying their staff a premium to encourage them to stay.

Politics are largely driven by local village issues and the resulting cost implications to households.

AusAID believe that donors should be doing projects (eg. a one-off capital expenditure or the establishment of a facility/infrastructure) rather than core activities that are undertaken by government departments (eg waste collection).

3.4 ENVIRONMENTAL AND SAFETY STANDARD

AusAID believe that projects should meet Australian standards only if it is appropriate. AusAID do have an Environment Policy. Furthermore for each AusAID project a minimum of a brief EIS is undertaken. AusAID have an MOU in place with Environment Australia.

3.5 CONTACT DETAILS

Name: Ed Peek

Organisation: AusAID, Samoa Office

Email: ed_peek@ausaid.gov.au

Date met: 15 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON MEETING WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

AusAID: Fiji Office

4. AUSAID

4.1 ACTIVITIES IN THE REGION

AusAID undertakes a number of activities in the Pacific region. Recent projects which are relevant to waste activities include:

- Working with SPREP with respect to POPs
- Waste management project in Tuvalu. This is a 3 year project and includes a waste characterisation study, waste minimisation approaches, establishment of a landfill, recycling (compost etc.) and other facets of waste management
- Range of public health activities and system reform approaches in various PICs.

For inquiries regarding Pacific activities:

Ms Ann-Maree O'Keeffe
Assistant Director General
Pacific Branch
AusAID
GPO Box 887, Canberra, ACT, 2601

The AusAID Tuvalu work is being undertaken by Golders Pty Ltd (who have also undertaken some work in Palau). The study did have elements of waste minimisation and considered the impact that imports have on waste volumes but the primary focus of the project is the landfill. Previously waste has just been collected from residents and then dumped depending on local conditions (eg wind) at the time. The waste characterisation study showed that waste contains about 60% organics. (There was a general agreement that this was typical from all meeting attendees). Based on this, a system has been established at the household level for the collection and composting of garden waste. The separated garden waste is collected and composted at a centralised facility, although it was originally intended that a number of composting centres would be set up. All residents are eligible to receive the resulting compost from this service. The residents are particularly receptive to this as Tuvalu is an atoll island where there is little soil available.

The landfill site selected in Tuvalu is a former borrow pit (the US filled in parts of the reef for use as a runway) which is to be lined with a polythene liner and filled progressively in cells (unsure of technical details).

4.2 PROJECT SUSTAINABILITY – ECONOMIC

With respect to the issue of recurrent funding (to ensure economic project sustainability), a study of 50% of the population was undertaken as part of the Tuvalu work. The study indicated that people generally agreed to pay more for waste collection if it is done effectively. Currently the Tuvalu residents are paying \$2 per week but this could double. The studies have found that by reducing volumes (through no organics) the system is reasonably economic and may actually be sustainable to the point of being able to afford buying major equipment such as trucks.

It was indicated that in Tuvalu there is only a very small private sector and the only tractor in the country is owned by the government. Therefore operation by the private sector isn't a realistic option.

AusAID indicated that with regard to the government setting aside funds for future operation and maintenance of the Tuvalu facility, this has not specifically been done. There is however, a requirement that the project manager ensures that the project is as sustainable as possible.

4.3 INSTITUTIONAL BARRIERS

The major problem with the Tuvalu project is in ensuring the right government departments are involved. People from the Ministry of Environment and Natural Resources were involved with the project and were very enthusiastic about it, however, infrastructure responsibility lies with the town council and there is politics involved between the two groups.

4.4 ENVIRONMENTAL AND SAFETY STANDARD

When implementing projects, the AusAID approach does not require projects to be undertaken to Australian standards. Projects that are assessed to have a certain environmental impact must be referred to Environment Australia for assessment. This issue is also addressed through projects having an integrated policy. For example, in Tuvalu, the environmental department must have a role and AusAID is working with them to help strengthen their capability in this area.

4.5 OTHER COMMENTS

SOPAC had an involvement with Tuvalu, which resulted in a small waste management document being produced. AusAID also did a similar study but the resulting document was the size of a phone book. Indicated that there needs to be better coordination with SPREP and SOPAC.

4.6 CONTACT DETAILS

Name: Geoff Adlide

Organisation: AusAID

Email: geoff.adlide@dfat.gov.au

Date met: 20 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
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REPORT ON MEETING WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

AusAID : Federated States of Micronesia (Pohnpei)

5. AUSAID

AusAID (Section PASU – FSM, Marshall Islands and Palau)

5.1 ACTIVITIES IN THE REGION

AusAID Pohnpei supports 3 tertiary scholarships in engineering related fields, including water waste management, mechanical and civil engineering.

The focus of AusAID in the waste management area for Micronesia is through the regional funding pool to SPREP.

With SPREP, AusAID was involved in a Workshop on the Effective Management of Hazardous Materials, Hazardous Wastes and Contaminated Land held at Pacific Skylite Hotel on 12-16 March 2001. Government personnel and related commercial operators were present at this workshop and the list was faxed (see file in the Correspondence section).

AusAID has not offered bilateral assistance in waste management to the individual countries under their responsibility. Waste Management assistance is through the regional mechanism – POP's in PICs (SPREP) that evolved following the 1997 Ferraris led regional waste management study in FSM and Marshall Islands.

5.2 MAJOR ISSUES FACED BY THE ORGANISATION IN PROVIDING AID

The State Economic summits have identified a number of priorities for action (solid waste management), however, it appears that problems associated with the regulatory environment and lack of public awareness remains.

Discussions at the recent workshop on the hazardous waste management, revealed continuing fragmentation of efforts by agencies. The National and State levels – and the added responsibilities of dealing with traditional leaders at the municipal level can delay forward movement

5.3 CONTACT DETAILS

Name: Dana Russo

Email: dana.russo@dfat.gov.au

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON CONVERSATION WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

NZODA : New Zealand

6. NZODA - REGIONAL

6.1 DISCUSSION ON PUBLIC PRIVATE PARTNERING (PPP) WORKS

Indicated that the original PPP program was done with the UNDP. SPM were sub-contacted by UNDP to be an implementing organisation of PPP projects. SPM are a non-profit organisation. (UNDP have since overkilled the term PPP).

NZODA have the aim of operationalising PPP (ie to actually develop projects rather than just determine if they can be implemented). The approach has been to assess the public department and works and package it into something that can be adopted by the private sector and thus form a joint venture.

Keneti provided an example of Iamo Bay that is north of Manilla where a successful project has been implemented. A New Zealand company was the private part of the PPP project involved in the establishment of a \$25M US waste facility including the use of biogas for electricity, which is then sold back to the grid. The approach in implementing this project was to first coordinate the public people and then package this up and approach the private sector. In undertaking this project, consideration was also given to the social aspects of the project particularly with respect to squatters at the landfill.

In the Pacific, the challenge with similar projects is that of scale (ie not as much waste available). However to date the SPM have signed an MOU with SPREP as well as the Samoan government which gives them access to the Tafaigata landfill. SPM have proposed various technologies for the landfill and they have now agreed on a pilot study of biogas generation.

The project will involve a \$3.5 – 5m facility, which will include building a landfill/pit from which generated gas will be captured. The gas will be trucked to desired location. While the high cost of electricity in Samoa WST\$0.63/kWh makes electricity production (from the biogas) attractive, it is still not necessarily viable to use for electricity generation. It is noted that LPG is imported and is also expensive and so the use of biogas in place of LPG is also being considered.

The problem with using biogas for cooking or similar purposes is usually due to the fact that it is not pressurised and is difficult to bottle. NZODA did indicate that in the Cook Islands someone has captured gas from 5 pigs and have developed technology to gradually increase pressure (by passing it through progressively smaller pipes). The one household has enough gas with 5 pigs!

The project has been based on the EU funded waste characterisation study (SKM). From this data the viability of the waste to energy project is questionable but when you add in other sources of waste for organic material, it becomes more attractive. Other waste sources include the brewery (have consented to give their waste) and septic tank sludge. In Samoa a \$50M US sewage system is proposed but the Samoan government realise that another loan to finance this is not possible. To empty a septic tank using the Public Works tanker truck costs around \$350 – 400 WST, which is considered a high cost for an unreliable system. The PPP program

is looking at utilising the septic tank material and this would result in a lower cost for septic tank emptying.

NZODA advised that it is the intention that a pilot plant for the biogas project will be in place by the end of the year. Two possible (private) companies have been selected for the project with one being American and the other New Zealand (he believes). The New Zealand company is favoured by SPM who tend to take a holistic approach to the project that includes consideration of training and capability.

The Samoan government does not have an energy policy, which makes things a bit more difficult.

For this project, the NZ ODA fund SPM who package all the information into a business case study. SPM effectively outline financing options / prepare a business case for the public sector. In terms of the public sector financial input, it will include the waste, which the public sector generally believe is theirs, and in the case of Samoa, the land at the landfill site (which is also owned by the public sector. These two contributions would be considered the government's financial contribution to a PPP joint venture. The DLSE has also been providing a graduate for full time work on the project, which is also another financial contribution.

In the Cook Islands the same MOU has been signed with the government. There is also a bilateral project for recycling being undertaken. When the Cook Islands were approached they were considering some ADB proposals and an ADB loan but when the PPP proposal was explained, this was more attractive as it means they don't require a further loan.

It was noted that Fiji would have been a good location to undertake a PPP project as they have a much larger scale but this was not considered given the current political situation.

6.2 AID COLLABORATION

NZ ODA considers collaboration of aid donors essential (and it has been a big issue in the Pacific region). To date, NZ ODA and AusAID have had a good relationship through their involvement in SPREP but also due to personalities.

It was noted that the governments of Pacific countries are always going to accept aid (they can't afford not to) but often need help in knowing how to proceed and collaborate all the aid for various project areas.

It was indicated that there is good collaboration on other environmental issues such as conservation and a Pacific round table/working group has been set up for collaboration on water and wastewater issues (as per a recent conference).

6.3 OTHER

It is considered that an integrated approach to waste management is the way forward and consideration of energy is also important (as in the PPP projects). NZ ODA has indicated a high willingness to work with JICA on this project and would appreciate any feedback on the project.

6.4 CONTACT DETAILS

Contact: Keneti Faulalo
Programme Manager – Multilateral/ Pacific Regional Environment CGIAR
Direct Line: 64 4 494 8255
Fax: 64 4 494 8515
Email keneti.faulalo@mfat.gov.nz

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON MEETING WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

NZODA: Samoa

7. NZ ODA

NZ ODA is New Zealand's Official Development Assistance (ODA) program and contributes to social and economic development that is environmentally sound and sustainable.

7.1 ACTIVITIES IN THE REGION

Major areas of activity undertaken by NZ ODA in the Pacific region include capacity building, institutional strengthening and education/training.

A recent project funded by NZ ODA is being undertaken by SPM. This is examining the possibilities of public/private sector partnerships and involves consideration of such issues as using private sector involvement in operation of the landfill. The project also includes consideration of a municipal waste to energy facility – biogas/cooking gas.

Most of the New Zealand aid environmental money goes through the South Pacific Regional Environment Programme (SPREP).

7.2 ISSUES WITH PROVIDING AID

NZODA believe that to get the most benefit out of an aid project it is suggested that the partner government must have budgeted funding for the operation and maintenance of the project. To resolve this issue, NZODA have adopted an approach of establishing a Memorandum of Understanding (MOU) which commits the governments receiving the aid to certain requirements.

It was also acknowledged that the provision of suitable equipment that was appropriate for Pacific conditions would ensure longer-term use of equipment.

NZ ODA have adopted an approach of training teams (backstopping) to prevent the problem of trained people leaving. The training has focussed outcomes but is not inputs or outputs based. The approach involves bringing an expert here for say 5 months, then they go away for 3 months and the local person takes over the role for a few months until the expert comes back and checks up.

NZODA also noted recent changes in government departments through the devolvement of financial responsibility (revenue retention) as this is considered to potentially have a wider applicability for aid projects.

7.3 ENVIRONMENTAL AND SAFETY STANDARD

NZODA adopts an approach of it is better to do a project to get things a bit better rather than try and install a "prestige" type of system at the outset. The approach to a project is that it is a gradual improvement. NZ ODA do note that while they may have some problems defending this

to an environmental lobby, it is somewhat defensible if it is regarded as a staged process, with the ultimate goal of meeting international standards.

7.4 CONTACT DETAILS

Name: Mr Craig Hawke

Organisation: New Zealand High Commission

PO Box 1876

Apia Samoa

Email: craighawke@mfat.govt.nz

Phone: +685 21711

Fax: +685 20086

Date met: 15 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON MEETING WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

European Union : Samoa

8. EUROPEAN UNION

The main office of the EU (European Union) is based in Fiji.

8.1 ACTIVITIES IN THE REGION

The EU Samoa office is currently working with SPREP on a demonstration project (EU waste education and awareness project) and has developed guidelines with SPREP (Guidelines for Municipal Solid Waste Management Planning in Small Island Developing States in the Pacific). The demonstration project also involved several waste characterisation studies.

EU Samoa office have financed a design and waste characterisation study for a small new landfill site in Vavau in Tonga. Construction work is about to commence on this project. This is being done through the Department of Foreign Affairs/Ministry of Health.

The EU is also undertaking a large project for the environment of Greater Suva area (including Suva/Lami around 200,000 people). The EU has prepared a financing agreement with the Fiji government but this is not yet finalised. The environment project covers:

- main outfall from the Sewage Treatment Plant.
- full landfill for greater Suva.
- education / awareness program which is supposed to cover liquid/solid waste but will realistically just cover solid waste.

The program will result in a huge dump between Nadi and Suva. A new site has been selected which will be used for a fully engineered landfill at Naboro, 15km from Suva. The EU has engaged a consultant (German) to do this work. The project is being managed through the Ministry of Environment. The Fijian government was supposed to engage a geotechnical consultant but this hasn't been done as yet. They have also made a commitment to undertake the institutional arrangements.

It has not been determined if the landfill will be privately or publicly run. A study is being undertaken to determine this, as well as details on how to run the landfill, what fees should be collected and how etc.

The studies and design has already been financed but the actual construction is not yet financed. Construction will be undertaken by a local contractor. The first phase of the landfill will last some 5 years.

It is noted that significant transport costs will apply as the landfill will service a large area.

The existing landfill at Suva will be closed and sealed.

If the project is successful, there are plans to replicate the project in Nadi/Lautoka

8.2 PROJECT SUSTAINABILITY – ECONOMIC

Refer to Section above. Measures have been incorporated into projects to undertake a study to determine the best operational practices for the Suva Landfill. This study will include consideration of ongoing project financing.

8.3 INSTITUTIONAL BARRIERS

The EU want to promote ownership of projects and are therefore encouraging secondments.

When undertaking projects such as the Greater Suva project (Naboro Landfill), the EU drafted a TOR together with the Fijian government to undertake the project. Such an approach was adopted to minimise / overcome potential institution barriers. The EU believes such joint development of the TOR is a good approach.

8.4 ENVIRONMENTAL AND SAFETY STANDARD

In Vavau (Tonga), the design consultant proposed not to accept international standards and this was accepted.

It is not clear what standards will be adopted for the Suva landfill although it will generally be designed to European standards with some exceptions eg. If it costs double to reduce leachate contaminant concentrations from say 100ppm to 90 ppm then they probably wouldn't do this.

8.5 CONTACT DETAILS

Name: Stephen Rogers / Enrico Strampelli

Organisation: EU

Email: stephen.rogers@delwsm.cec.eu.int

Date met: 16 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON MEETING WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

European Union : Fiji

9. EUROPEAN UNION (EU)

9.1 ACTIVITIES IN THE REGION

There are two European Commission Delegations in the Pacific, One in PNG (covering PNG, Solomon Islands and in the near future Vanuatu) and one in Fiji (covering Fiji, Tonga, Samoa, Kiribati, Tuvalu and the Pacific regional programs). 6 new ACP (African, Caribbean, Pacific) countries are now under the responsibility of the Fiji Delegation (Niue, Nauru, Cook Islands, FSM, Palau and Marshall Islands although no projects have commenced in these countries).

The EU has been undertaking a regional waste education and awareness program although this is coming to an end (this was done with SPREP). Have undertaken a waste awareness baseline study in Fiji, Samoa and Kiribati that assessed the current level of awareness. It is intended that at a later date, the same methodology will be applied to determine the awareness level changes. The EU has also been involved in waste characterisation studies in several countries. They are keen for the developed awareness material to continue to be used by bodies such as SPREP.

The EU has been working on a new landfill outside Suva although it is noted that financing agreements have not yet been signed but the technical studies are ongoing. The EU indicated that there is an awareness campaign as part of the landfill project.

9.2 ISSUES FACED IN PROVIDING AID

The Suva landfill project includes in the TOR a requirement for a study reviewing institutional arrangements (and to ensure ongoing funding of the project). The EU recognises that major grant infrastructure projects such as landfill construction are a very good opportunity to ensure that sustainability and institutional issues are dealt with properly.

The EU has also experienced the general occurrence (not necessarily in environment) of training people who then move on to other jobs where their training may not be relevant. Consequently the EU have moved away from undertaking specific training-only funding and training is only undertaken as a component of larger development projects. Training is also provided on the job through technical assistants.

Landfills are regarded as necessary and aid agencies are often placed under a lot of pressure to provide for projects that are considered a necessity

9.3 ENVIRONMENTAL AND SAFETY STANDARD

With respect to environmental standards it is noted that the European Commission administered projects are funded under successive conventions/agreements between ACP (Africa Caribbean and Pacific) countries and the EU (under the European Development funds, EDF). Under these Agreements (last one the Cotonou Agreement), the implementation of the agreed projects is the

responsibility of the National or Regional Authorities (EDF National/Regional Authorising Officer. The choice of the standards is therefore a national or regional responsibility but generally follow major regional standards. Prior to financing, the European Commission reviews the environmental aspects of all projects and if it is considered that standards of a reasonable level have not been adopted then higher standards may be requested.

9.4 OTHER COMMENTS

It was indicated by the EU representative that the Pacific region would be interested in having a regional organisation holding all information on a particular type of activity (eg. waste management) in the region. The EU indicated that the appropriate regional organisation should probably be SPREP with input from SOPAC.

The EU has encountered the problem of having problems disposing of waste from their own projects (eg. Solar powered batteries in Kiribati). A follow-up project will carry out studies on the necessary recycling and disposal of batteries.

9.5 CONTACT DETAILS

Name: Guido Carrara

Organisation: European Union

Email: eudelfiji@eu.org.fj

Date met: 20 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
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REPORT ON MEETING WITH AID AGENCY / REGIONAL /
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UNDP : Samoa

10. UNDP

The United Nations Development Program (UNDP) is the branch of the United Nations, which assists in developing countries. The UNDP are the implementing agency of GEF.

10.1 ACTIVITIES IN THE REGION

The UNDP are not currently undertaking any projects in waste management but do work closely with SPREP (currently with respect to a marine project). While they haven't done much work in the waste area, they do have an interest in it.

10.2 ISSUES ASSOCIATED WITH UNDERTAKING PROJECTS/ COMMENTS ON WASTE MANAGEMENT

UNDP generally undertakes training through regional workshops

Understands that in Tokelau, all waste is placed on another atoll.

In general the UNDP is moving away from capital works and is focussing more on the issue of capacity building.

UNDP believes that more coordination between donors would be useful when funding projects

UNDP believes that there is insufficient capacity in government.

10.3 ENVIRONMENTAL AND SAFETY STANDARD

UNDP believes that the lack of environmental standards is a problem although they do not provide infrastructure so this isn't as much of an issue.

10.4 CONTACT DETAILS

Name: Tom Twining-Ward

Organisation: UNDP, Samoa Office

Email: tom.twining-ward@undp.org

Date met: 16 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
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UNDP: Fiji

11. UNDP/GEF

11.1 ACTIVITIES IN THE REGION

Currently the GEF unit does not have any solid waste management projects although they are working with the USP to develop a regional project on POPs (Persistent Organochlorine Pollutants). This will be linked with the SPREP / AusAID project. The future role of the UNEP and UNDP is still being developed but there is a chance that UNDP will become more involved at the national level. The GEF has now approved funding to assist countries develop national level reports on POPs. The Enabling Activities become available to countries upon signature of the Stockholm Convention and there is no need for the country to have ratified. UNDP Suva in June 2001 wrote to each of the 10 countries covered by the office inviting them to give details of POPs focal points and to request assistance, if desired, to produce their national reports on POPs. The amount of assistance available through GEF/UNDP will be to a maximum of USD\$500,000.

GEF's activities currently are mostly in relation to biodiversity and climate change.

11.2 PROJECT SUSTAINABILITY – ECONOMIC

GEF emphasises sustainability. Before the end of the project, they make it clear that there is no guarantee or promise of ongoing funding. As such, new projects (Suva UNDP/GEF has 13 projects at a national level, not large regional projects) have built in financial sustainability. This is recognised as being difficult, but integral to the projects.

11.3 INSTITUTIONAL BARRIERS

Recognise that there are institutional barriers – particularly with government departments not communicating with one another (eg. In Tonga government departments such as Central Planning, Foreign Affairs and Environment don't adequately communicate and there are issues where responsibility lies. An example is, which department should communicate with donors and give final approval of projects). The high turnover of staff and the amount of international travel undertaken by staff in environmental departments are also a major issue.

Another problem is the large number of reports that are (or are required to be) prepared as part of country commitments made when ratifying global conventions, but there is often a lack of capacity to both produce the reports and then later, to implement the report recommendations.

The GRF consider asset maintenance a huge problem. The GEF addresses this issue by including training of local people (to maintain the equipment) as an integral part of the project. There is concern that this isn't widely done by all donor organisations, thus setting a precedent of 'free aid', especially in the area of renewable energy projects, which is not conducive to long term sustainability.

Concern was raised that while regional organisations often have in-house expertise there has to be a focus on the national/local level in terms of waste management. The experiences in waste management (good and bad) could be shared but activities need to be local. Centralised waste projects with one organisation can build capacity in a regional organisation but not in-country where it is most needed if projects are to work successfully in the long-term.

11.4 ENVIRONMENTAL AND SAFETY STANDARD

No comments

11.5 OTHER COMMENTS

No comments

11.6 CONTACT DETAILS

Name: Dr. Jenny-Bryant-Tokalau

Organisation: Global Environment Facility, UNDP

Email: jenny.bryant@undp.org

Date met: 20 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
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WHO: Samoa

12. WHO

12.1 ACTIVITIES IN THE REGION

The WHO, Samoa office encompass responsibility for five countries including Cook Islands, American Samoa, Tokelau and Nuie. WHO activity in the Samoa office is mostly focussed around the hospital (with dealings through the Ministry of Health) and to concerns relating to public health. The WHO also undertakes training in the region and has undertaken a training course in conjunction with the South Pacific Regional Environment Programme (SPREP) and with the Japan International Cooperation Agency (JICA).

The WHO recognise that they are generally just called in when there is a problem and that they don't really play a proactive role in the issues of the region. WHO only provide infrastructure on a minor basis as well as providing some supplies and equipment.

12.2 ISSUES WITH UNDERTAKING PROJECTS

The WHO recognise that there are often resourcing difficulties, mostly relating to staff, in the Pacific region. Often (government departmental) staff is not available to see a project through. The WHO has been looking at the retention of health professionals through a current study that is reviewing staff movement.

The WHO believes that Pacific Island countries, should be considered as a region rather than individual countries but acknowledged that there isn't enough interaction between the countries to achieve this yet.

12.3 ENVIRONMENTAL AND SAFETY STANDARD

The WHO doesn't like to enforce particular standards on a country but they do need some sort of standard to work to.

12.4 CONTACT DETAILS

Name: Anne Wood

Organisation: WHO, Samoa Office

Email: anne@who.org.ws

Date met: 15 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
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WHO: Fiji

13. WHO (WORLD HEALTH ORGANISATION)

13.1 ACTIVITIES IN THE REGION

The WHO Environmental Fiji representative covers both the Fiji and Samoa offices (Samoa also covers 5 countries) and is the only environmental health person for WHO in this region. It was indicated that WHO was not an aid agency but an agency that provides technical assistance. Waste management is definitely an area of interest to WHO and it does a range of activities including workshops and training programs. WHO, Fiji was involved in the SPREP/JICA/ WHO training program.

13.2 ISSUES FACED BY THE WHO IN UNDERTAKING PROJECTS

WHO prefers to undertake in-country training and try to keep training relevant. They have expressed an interest in finding out who is undertaking good waste management training (in underdeveloped countries).

There is also an issue of finding the right people to undertake the training. (WHO noted that SPC had a program where supervisors had to outline how the training was going to be used in the job. A certificate for completing the course wasn't given until the trainee was assessed applying the training on the job).

WHO indicated that there is a project in Nadi/Lautoka to use vermiculture for treating organic waste. Contact person is Navi Litidamu, Senior Lecturer (Environ. Health) School of Public Health and Primary Care.

13.3 CONTACT DETAILS

Name: Dr Donald Sharp

Organisation: World Health Organisation, Fiji

Email: sharpd@fij.wpro.who.int

Date Met: 20 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
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SPREP : Samoa

14. SPREP

The South Pacific Regional Environment Programme (SPREP) was set up to promote co-operation in the South Pacific region and to provide assistance to protect and improve its environment and to ensure sustainable development for future generations. The South Pacific Regional Environment Programme (SPREP) aims to provide a coordinated regional approach to environmental problems, serving as an information referral centre and providing technical assistance to its member governments among the Pacific Islands countries and territories.

14.1 ACTIVITIES IN THE REGION

Current and future activities being undertaken by SPREP in the waste management area include:

- Landfill demonstration projects to be undertaken by Shiro Amano (JICA Senior Expert).
- Waste education and awareness activities undertaken through an EU project managed by Suresh Raj. This supported various in-country initiatives in 8 countries (eg. In Samoa, a TV commercial was produced to discourage dumping, reuse of plastic bags etc.). At a regional level, the project produced a waste awareness video, a comic book, TV commercials and a poster. Most of these were aimed at teenagers.
- Suresh Raj's project also involved waste characterisation studies in 8 countries, and the development of country action plans for improvements in waste management.
- Phase II of the POPs in PICs project whereby PCB's are to be picked up from 12 countries and taken to Australia (or elsewhere) for disposal. The project is to be funded by AusAID (\$3M). One of the key issues to be addressed will be the administrative and legal requirements under the Basel Convention, for shipping of hazardous wastes between countries.
- Training courses in hazardous waste management were presented in 15 locations around the region, as part of the POPs in PICs project. Specific Action Plans have been developed for each country, and these will be followed up by SPREP over the next two years.
- National and regional hazardous waste management strategies are to be developed under the HazWaste project, which is funded by NZODA.
- Timber treatment chemicals (esp. arsenic), old pesticides, oil contaminated sites and old bitumen are other problems identified in the POPs in PICs project. Funding is currently being sought to address these issues.
- The PacPol programme is supporting an AVA position in Kosrae which involves developing a waste management plan for Okat harbour

- Together with NZODA, SPREP has an alliance with a non-government organisation called Sustainable Project Management (SPM) which is investigating options for public/private sector alliances in the waste management area (and others). A specific proposal has been developed for Samoa and will shortly be taken to a pilot stage. Part of the study includes an assessment of billing options, and these could include additional airport taxes on tourists, or charging through electricity bills (ie. Charge through a service that residents are already paying for).

14.2 PROJECT SUSTAINABILITY – ECONOMIC

SPREP recognise that ongoing funding is an issue with project sustainability. Government staff are generally capable people but are seriously overloaded (have to respond to a lot of external requests such as conferences, aid donors etc.).

Assets provided by aid donors are often inadequately maintained due to the lack of technical capacity. It is acknowledged that assets can get taken over for other uses and that providing equipment/machinery with a dedicated use (ie that can't be used for other purposes) is a good idea.

SPREP is not a funding agency, and all of their activities are paid for by donors and/or member countries. They do not generally have a role in infrastructure development, which is normally funded through bilateral agreements. However, their environmental activities will often highlight the need for infrastructure improvements.

14.3 INSTITUTIONAL BARRIERS

SPREP generally believes that the skill levels of government employees are gradually improving, and in some countries (eg. Samoa) the staff is now very capable. It was noted, however, that one area for further improvements is in career planning and management. For example, nominations for attendance at conferences and courses are often done on an ad hoc and/or arbitrary basis

14.4 ENVIRONMENTAL AND SAFETY STANDARD

There are no environmental standards in general use throughout the region. If SPREP needs to use standards it would generally refer to those recommended in Australia, New Zealand, or the USA, or by international agencies such as WHO. Some Pacific Island Countries have expressed interest in the development of regional standards but there has been no action in this area to date.

It was noted that most of the former US territories have legislation and regulations that reflect current or historical US standards.

14.5 OTHER

It was noted that the current work by Egis dovetailed into the work being undertaken by Shiro Amano under the JICA programme. This will include a review of current practices at landfills in various countries and the development of guidelines for incremental improvements.

It is believed that waste management awareness is being addressed well in Samoa at the moment.

Other relevant work being undertaken in the region includes an AusAID project in Tuvalu to upgrade solid waste management. This has been successful in diverting a lot of organic wastes

from the landfill. AusAID have also supported an AVA person in Nuie (Greg Woolfe) who has produced a solid waste management strategy in consultation with the community. The work focussed on waste management including the waste collection service rather than focussing on the landfill.

It was acknowledged that the waste characterisation data produced by SKM for the EU project is based on very limited sampling.

Cultural issues should not be ignored in the design and implementation of aid projects. For example, composting toilets do not appear to be widely accepted in the region because of issues such as building size and location, and attitudes towards communal toilet facilities.

Container deposit fees are being considered in some Pacific Island Countries. However, the introduction of these needs careful management. For example in American Samoa a proposal was rejected by the Senate for largely political reasons.

14.6 CONTACT DETAILS

Name: Dr Bruce Graham / Mr Shiro Amano

Organisation: SPREP

Email: BruceG@sprep.org.ws / shiro@sprep.org.ws

Date met: 14 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
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FAO : Samoa

15. **FAO**

The Food and Agriculture Organisation (FAO) was established to raise levels of nutrition and standards of living, to improve agricultural productivity, and to better the condition of rural populations. The FAO focuses its activities in the area of agriculture, forestry, fisheries and rural development. The FAO has 11 member countries (from the Samoan office) and a further regional office in Bangkok.

15.1 **ACTIVITIES IN THE REGION**

FAO is engaged in:

- Surveying and monitoring potential problems of existing stockpiles.
- Creating and distributing guidelines for safe storage, for preventing accumulation and for removal.
- Initiating and formulating disposal projects for member countries.
- Sensitizing and mobilising the public through raising awareness, assisting review of pesticide legislation, etc.

Waste management activities undertaken by FAO include dealing with the pesticide register (which deals mainly with obsolete and old pesticides, including prohibited agricultural chemicals). It is noted that the FAO did not participate in the POPs study as they had already commenced their own study (the POPs report was more broad anyway)

FAO has offered to review quarantine legislation and bring it up to IPPC and WTO requirements/standards.

General activities undertaken by FAO include education, recordings, projects related to food security, educating farmers (eg with respect to compost).

FAO did indicate that they were aware of a new incinerator for Niue Island under NZ ODA funding.

FAO provides partial funding for an FAO correspondent in each country

15.2 **ISSUES ASSOCIATED WITH PROJECTS**

Noted that the maintenance of incinerators is not generally good

FAO have adopted an approach (eg. in Telefood projects) of trialing activities on a small scale and when proven to be successful, it is expanded to a bigger project e.g. Technical Cooperation

Programme (TCP) up to US\$400,000.00. Telefood projects are small projects (up to US\$10,000.00) which help regional villages in the area of fisheries food crop production

15.3 CONTACT DETAILS

Name: Matairangi Porea

Organisation: FAO, Samoa Office

Email: Mat.Porea@fao.org

Date met: 16 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
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SOPAC: Fiji

16. SOPAC

The South Pacific Applied Geoscience Commission (SOPAC) is a regional intergovernmental organisation of the Pacific with the following member countries: Australia, Cook Islands, Federates States of Micronesia, Fiji Islands, French Polynesia (Associate), Guam, Kiribati, Marshall Islands, Nauru, New Caledonia (Associate), New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

SOPAC's work for its member countries focuses on three key areas; resource development; environmental geoscience and national capacity development in the geosciences. To effectively deliver these services SOPAC maintains a regional data centre, provides information services and offers technical and field services for specific project work. Specialist knowledge is accessible through SOPAC in any of its focus areas.

16.1 ACTIVITIES IN THE REGION

Recently, SOPAC has been involved in the Pacific region in the development of a methodology for determining environmental vulnerability. This issue is of great importance to Small Island Developing States (SIDS) particularly in the light of the growing desire for sustainable development. The issue of environmental vulnerability encompasses all aspects of both natural hazards to the environment such as cyclones, floods and volcanoes, as well as hazards caused by human activities such as over-exploitation of resources and pollution, etc. The issues of solid waste and its disposal also play an important part in the vulnerability of island environments. SOPAC has an interest in waste management from a sanitation point of view. Water is one of primary focal areas that SOPAC addresses through the provision of assistance in the assessment, management and protection of the water resources in the island member countries. As the availability of safe, potable water is a critical issue in most island countries, particularly in the freshwater-scarce atoll islands, SOPAC has had to complement its activities in water management with advice on waste disposal.

Among the regional organisations of the Pacific, the principal mandate for solid waste management rests with the South Pacific Regional Environmental Programme (SPREP). Owing to its involvement in Water Management and its expertise in Resource Management and Environmental Geoscience, SOPAC has had contributions to solid waste management in the region. SOPAC, in collaboration with SPREP, developed a Solid Waste Management Plan for Funafuti, Tuvalu. SOPAC's involvement was critical given its expertise in the geotechnical side of waste site locations and management and its status as the regional repository of geoscientific data on the member countries.

16.2 ISSUES FACED IN PROVIDING AID

SOPAC encourages Pacific countries to learn from each other through the sharing of knowledge and experiences. Hands on training in the field, training attachments to the Secretariat, structured courses in conjunctions with the University of the South Pacific for member country nationals and technical workshops are commonly used to strengthen national

capacities. However, a common problem has been the migration of the staff with newly enhanced skills out of the government sector. As such movements are often on monetary considerations, it is common to have these skilled personnel in jobs that do not utilise their skills while the country remains understaffed in key specialised areas.

SOPAC is aware of examples where a waste levy is collected on different types of packaging imported (i.e. plastic bottles, aluminium cans etc) which goes into a trust fund for the recycling and effective management of the packaging materials when they become waste products (Barbados). In Barbados, the Environment Department is currently considering how to treat tetrapak, which is not covered under the current legislation. Other examples of financial incentives to reduce waste are:

- Storage and recycling sites for vehicle battery disposal in Pohnpei, FSM
- Discounts for customers who bring their own shopping bags in Hawaii

Contact Details

Name: Craig Pratt

Organisation: SOPAC

Email: craig@sopac.org

Date met: 20 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
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Secretariat of the Pacific Community (SPC) - Fiji Office

17. SPC

The Secretariat of the Pacific Community (SPC) is one of the oldest inter-governmental agencies in the region and has been operating for over 50 years. SPC covers the Pacific region including territories. Activities are focussed in the major areas of agriculture, health and fisheries.

The agriculture division covers areas such as crop improvement, animal health, agricultural economic improvements and plant protection.

The SPC are a regionally focused organisation (as compared with the activities of FAO). SPC is funded by member countries including Australia, New Zealand, France, US, UK plus some funding from aid organisations such as AusAID, ODA, UNDP

17.1 ACTIVITIES IN THE REGION

SPC is interested in waste activities from the point of view of soil conservation and the impacts on agriculture although they do not have a direct interest in waste disposal sites.

They are developing an initiative to look at piggery wastes in atoll countries and volcanic islands. Particularly the atoll countries have high pig populations (often higher than the human population) and this waste could be used for fertiliser to avoid the use of chemical fertilisers.

17.2 PROJECT SUSTAINABILITY – ECONOMIC

SPC do not generally provide infrastructure and therefore are less involved with issues of project sustainability following the provision of capital works items.

SPC do however agree that there are instances where proper maintenance of aid-provided equipment is not undertaken. SPC also consider that project sustainability (ongoing equipment use etc.) can be improved by ensuring that the equipment that is provided is appropriate for the conditions.

More generally on the issue of sustainability, it was noted that agricultural systems are not currently being operated as sustainably as they were in the past. Previously it was common practice to operate a fallow system but with the higher demands for land, this isn't being done so much.

17.3 INSTITUTIONAL BARRIERS

SPC recognise that in small countries with small populations, there will always be difficulty in keeping staff. To address this, SPC are undertaking a number of measures including progressively training at lower levels, conducting in-country training and training people in groups.

SPC have often found that training programs undertaken in developed countries are not appropriate for their needs. This is a common finding for training of people from developing countries. In general they (SPC) are trying to focus more on in-country training that is more appropriate, lower cost and provide training to more participants.

It was noted that the USP (University of South Pacific) has started distance training (training by correspondence). SPC consider that the Pacific area is ideal for this sort of training and this approach is being used in a para veterinarian training project. Other activities include making information available over the Internet although this is probably a bit too far advanced just yet.

17.4 ENVIRONMENTAL AND SAFETY STANDARD

The application of environmental and safety standards to projects is not generally applicable to SPC activities as they do not provide infrastructure.

17.5 CONTACT DETAILS

Name: Thomas Osborn

Organisation: SPC

Email: tomo@spc.int

Date met: 19 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
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Fiji Sugar Corporation : Fiji

18. FIJI SUGAR CORPORATION (FSC)

18.1 ACTIVITIES IN THE REGION

The Fiji Sugar Corporation (FSC) has a large solid waste disposal problem relating to boiler ash and filter mud. The sugar mill employs some 3500 people (plus cane farmers) with 4 mills – 3 on the mainland (Viti Levu) and 1 on Vanua Levu. The Lautoka plant processes some 1.4 million T/yr with an average rate of 360T cane/hr and it is the largest of all the mills. Other sites are at Rarawi (1,000,000T/a), Labasa (1,200,000 T/a) and Penang (400,000 T/a)

The resulting by-products (from the Lautoka plant) are as follows:

- 378,400 T bagasse
- 46,200 T mill mud (high in organics). Derived from a chemically assisted process but is basically the filtrate in purifying sugar. It does have an odour, is typically hot and requires about 3 – 4 months to cure. Initially the mud is approx. 60% moisture
- 30,272 T boiler ash

The bagasse is contained and burned to generate steam. The disposal problem lies with the mud and ash as they are running out of room to dump this. The only wastes they take to the dump are leave cuttings.

The ash is very lightweight and it blows away when it dries. The FSC have dumped the ash for over a 100 years. Currently the Department of Environment together with the USP and the Department of Public Works is looking at options for ash disposal. The Lautoka mill still has land to place the ash on but other mills aren't so fortunate.

The FSC are considering a cogeneration plant at Karawai Mill, which would use bagasse to create electricity that can be sold to the electricity supplier (back to the National grid). The plant would also use surplus wood waste from Tropic Pine (pre-treatment). An impact assessment has already been undertaken for the development at a cost of \$180,000. The cost of the cogeneration plant is estimated to be \$28 – 30M and is being undertaken in conjunction with a French group.

The FSC have undertaken study visits to Australia to review their waste management practices. In Australia they mix the mill mud and ash and plough it back into the fields. They are trying to do this in Fiji but they need to educate people about the benefits of doing it.

18.2 CONTACT DETAILS

Name: Prof. William Thaggard

Organisation: Fiji Sugar Corporation

Date met: 23 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
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USP: Fiji

19. USP (UNIVERSITY OF THE SOUTH PACIFIC)

19.1 ACTIVITIES IN THE REGION

Environmental activities undertaken by USP include monitoring of water bodies since 1989 (Lami Bay etc.). USP currently has students monitoring water quality around Lami dump to determine the contaminants arising from the dump. There has also been work in developing the "Rapid Assessment of Marine Pollutants" which provides for quicker analyses than the expensive and slow chemical analyses usually undertaken. This will rely on changes identified under the microscope and can be used to get schools involved.

USP is currently doing a project with the World Bank with respect to composting. It has previously been found that composting operations are viable (in Pacific Island countries) but problems exist with the government implementing them. With respect to aid projects (composting), it is considered that small focussed projects are required rather than large (say) \$20M projects.

19.2 COMMENTS ON SOLID WASTE ISSUES

USP indicated that consideration had been given to the implementation of a waste disposal tax for any imports that don't naturally degrade. This has been pushed but USP isn't sure if it has successfully been implemented anywhere.

With respect to training there needs to be more emphasis on making it appropriate and should be done in-country or in a similar type of country. It is believed that one-off workshops are not effective and are very expensive. There are too many workshops and not enough working in the field. In general meetings / training funds are not used effectively in the Pacific.

19.3 ENVIRONMENTAL AND SAFETY STANDARD

It is generally recognised that you shouldn't force your standards on someone else however it should not be considered that the health or environment of a less developed country is less important than a developed country.

It is believed that larger companies generally try to adhere to good environmental standards anyway (regardless of environmental legislation or lack thereof). Some companies (in Fiji) are seen as being proactive and it is the government that is going to have difficulty in adopting environmental standards.

19.4 CONTACT DETAILS

Name: Prof. William Aalbersberg

Organisation: USP, Institute of Applied Sciences

Email: Aalbersberg@usp.ac.fj

Date met: 20 March, 2001

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Hydroplan: Fiji

20. HYDROPLAN

Hydroplan is the consultant engaged by the EU to undertake the design for the new landfill site to be located outside Suva (called the Naboro Landfill).

20.1 ISSUES WITH LAMI DUMP

Hydroplan have noted the following with respect to the existing Lami dump:

- The major odour source is due to fish and chicken waste.
- The Lami dump is some 55 years old.
- The cost of using the dump is very high for industry and this may be resulting in illegal dumping.

20.2 NABORO LANDFILL – PLANNING, DEVELOPMENT

Hydroplan reported the following issues associated with the planning and development of the new Naboro landfill :

- It is believed that the SKM report underestimated population figures by approximately 50%. The waste figures they used were based on weighbridge data but this is too unreliable.
- Hydroplan indicated that it would be desirable for the Naboro landfill (new landfill) to serve all of the Coral coast.
- Believes that at this stage, projects should generally be undertaken by private companies as the government is understaffed and often lack practical experience.
- The current Terms of Reference (TOR) for the landfill project is somewhat limiting as although it is good that some parts of the project must be completed by the government, this has already delayed things by 6 months (the consultant isn't paid until completion of stages). Hydroplan believes that at the absolute earliest the dump will be available is mid-2003.
- Geotechnical studies are being undertaken by Tonkin and Taylor.
- The landfill requires a mineral liner, not clay. They are likely to use a geosynthetic clay liner.
- Typically waste in Fiji has an extremely high moisture content and rainfall is 3500mm per year.
- Leachate from the new landfill will be a problem and does require treatment, which may be either mechanical, biological or wetland. It was intended that leachate from the Lami dump goes to the sewage treatment plant but currently it just drains into the sea.

- Hydroplan realise that for the project they need to provide appropriate technologies, which may not necessarily meet environmental standards.
- Noted that there are some industries producing hazardous wastes including wood processing (CCA), POPs, and metal working shops.
- The Naboro Waste Company Limited has been set up by Hydroplan.
- Institutional people (Hydroplan) are coming in June/July to undertake a study to determine the best means for establishing and operating the landfill.
- Recommended that at the new landfill, the flat area in front of the site (between the landfill and the road) should be used for recycling facilities (composting, recycling etc.)

20.3 GENERAL COMMENTS

Noted that EU is the biggest donor including support/donations to the sugar industry.

The Sustainable Development Bill is very tough and it is going to be hard to meet it.

Considers that a Master Plan for waste management across the whole of Fiji is necessary. A major consideration of such a plan would be the search for land!

20.4 CONTACT DETAILS

Name: Peter Heckel

Organisation: Hydroplan

Email: info@hydroplan.de

Date met: 22 March, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY
GUIDELINES FOR SOLID WASTE DISPOSAL SITE MANAGEMENT
IN PACIFIC ISLAND COUNTRIES

REPORT ON CORRESPONDENCE WITH AID AGENCY / REGIONAL /
INTERNATIONAL ORGANISATION

Pohnpei Waste Management Services: Pohnpei, FSM

21. ORGANISATION:

Pohnpei Waste Management Services

21.1 CONTACT DETAILS:

Name: Mr Robert Spegal

Tel: (691) 320 5058

Email: opalpac@mail.fm

21.2 DATE OF REPLY:

20 March 2001

21.3 RELEVANT ACTIVITIES OF THE COMPANY

Pohnpei Waste Management Services (PWMS) received a Foreign Investment Permit from Pohnpei State (one of the four states in the Federated States of Micronesia [FSM]) in September 1996, and a similar permit from the FSM in February 1997. The "Scope of Permit" allows PWMS to provide waste management and collections services in Pohnpei State. The company's owners include Mrs. Erine M. McVey and Mrs. Maria I. Spegal, both FSM citizens and majority shareholders. The remaining owners include Mr. Timothy McVey, Dr. M. Jan Pryor, Mr. Robert W. Spegal, and Ms. Aying Wang.

PWMS began actual operations in February 1997, providing dump-site/landfill management services at the Dekehtik site near the Pohnpei Airport under a contract with the Pohnpei State Department of Resource Management and Development. Solid waste collection services to customers were initiated in June 1997 with the national government capital complex, the public high school, the local college, and an apartment complex, as the first accounts.

In January 2001, PWMS completed its fourth year-long contract for dump-site/landfill management with Pohnpei State, and is now continuing to provide service under a "continue-to-work" order while waiting for funds to support the 2001 operations to be identified by the government. During this four-year period several improvements to the site have been completed. Prior to PWMS' involvement, a trip to discard a bag of trash was an unpleasant and dangerous undertaking. Many people refused to hazard a drive into the actual dump area and disposed of their trash along side the road, thus blocking the dump entrance and causing debris to overflow onto the roadway that connects the airport to the main town. Those individuals brave enough to enter the dump risked stuck vehicles, ankle deep muck, swarms of flies, packs of cats and rodents, and an overpowering stench.

At the present time, the situation is much different:

- the operational dumping face is more than 100 meters distant from the road
- a fence prevents any windblown trash from escaping the dump and shields the entire operation from view as one drives past
- a hard-packed coral surface access loop driveway permits safe and dry approach without the necessity for vehicles to reverse direction
- an attendant is available during all working hours (including weekends) to direct the dumping activities and provide assistance
- daily bulldozing (two pieces of dedicated heavy equipment on-site) of accumulated waste keeps vermin, flies, and odour to a minimum
- separate areas to receive and store waste oil and lead batteries have been established
- vegetation is segregated from other solid waste to support future composting efforts
- dumpsters (collection bins) are located near to the dump-site entrance to accept small household loads and eliminate the necessity for many "customers" to proceed further into the dump
- a large section in the centre of the dump area (cell #1) has been closed and renovated

PWMS' collection efforts have also grown. A total of 90 dumpsters are now in place servicing fifty-six accounts, including stores, restaurants, hotels, schools, embassies, churches, government offices, apartment complexes, and several private residences. Collection equipment consists of two Volvo front loader packer trucks, a small (5cy) dump truck, and dumpsters of three sizes: 6, 4, and 2 cubic yard. Last year's order of twenty dumpsters, from a vendor in Australia, increased to 99 the total number of dumpster units purchased since 1997. A small number of customers' locations are inaccessible to our large packer trucks; we provide these accounts with trash cans and collection services utilising the dump truck.

PWMS employs a team of eleven FSM citizens - eight full-time positions cover the dump management and collection services, and three part-time administrative positions to handle accounts, payroll, taxes, governmental relations, etc. The crew consists of a supervisor/mechanic, three drivers/heavy equipment operators, and three attendants/"shotguns". Flexible scheduling and the back-up system permits corporate sensitivity to the time obligations demanded by Pohnpeian culture. Two of the office staff are likewise able to handle all typical administrative matters.

Dumpsite employees have received job-related and safety training and observe basic safety rules. Appropriate footwear and shirts are provided to the employee by the company. PWMS drivers have strict regulations concerning the operation of the vehicle. The "shotguns" accompanying the collection trucks on their routes provide an extra measure of safety. Their duties include watching traffic and directing the driver, positioning the dumpster for pick-up, keeping observers away from the operation (out of danger), and completing the log recording the time of the collection and an indication of the bin being full, half-full, or nearly empty.

At this time, we know of no means, on island, of weighing the waste collected. If each of the 118 dumpsters (the average size is 4cy) that are emptied each week were full, 472 cubic yards would have been brought to the Dekehtik site. This is the equivalent of 25,000cy per year. A review of our logs for last year reveals that 65 to 75% of the bins are full when collected.

21.4 MAJOR ISSUES FACED BY THE COMPANY PROVIDING SERVICE

PWMS's difficulties fall into three main areas: equipment, over due accounts, and governmental relations.

Equipment - The cost of repairs to the equipment continues to be higher than might be expected for a similar business in a less harsh environment. The geographical isolation of Pohnpei results in high freight expenses that add to this cost. We perform preventive maintenance and keep equipment repaired. During the latter half of 2000 one truck was down while the transmission was replaced at a cost of over \$6000. We expect a long life out of our D-4 Caterpillar Bulldozer since we have replaced almost every part. The PWMS management understands the critical importance of having back-up equipment to an operation such as ours.

Accounts - Aggressive follow-up is necessary with about one half of our accounts. Our worst account is a municipal government, which we may have to sue for more than \$3000. An interruption in solid waste collection has much less impact than if one's electricity is shut off, so much of our office work is directed towards keeping accounts as current as possible. Many local businesses have difficulty collecting past due accounts. In customer relations, cultural considerations should be respected, but the nature of the business transaction must respect economic realities.

Accounts from government offices are notoriously slow and consume much PWMS employee time and effort visiting offices to inquire as to the status of a payment. The most frustrating account is the dumpsite management contract with Pohnpei State. It is a single year contract. Each year, PWMS has provided reminder letters to the government concerning the expiration of the contract. Every year the government has not located the funds for the new contract, so PWMS works on a "continue" order. After the funds are secured, the contract is put out to bid. PWMS has underbid all other serious competition each year. Meanwhile, wait for three months for the first payment.

Government - The government policy establishing the single year contract and the bid requirement prohibits PWMS from getting bank financing to purchase the most appropriate heavy equipment (such as the Caterpillar 936 Landfill Compactor) for dump management. A piece of equipment such as this compactor would add years to the life of the landfill operation.

The enforcement of littering laws would facilitate improvement in the overall cleanliness of the island, particularly along the roadsides and at locations popular for picnics, swimming, watching the sunset, etc. High weeds along the roadside hide most of the discarded refuse. When the weeds are trimmed, it becomes "instant trash". PWMS can provide dumpsters that would assist to address this problem.

Many villages and families have unofficial mini dumps in the mangrove swamp along the shoreline. These are unsightly and a source of pollution to the marine environment. The establishment of transfer stations, and state subsidised collection services address this matter and serve to bring some equity to the situation. At the present time funds spent by Pohnpei State to operate the Dekehtik Dump-site/Landfill unfairly benefit residents of Kolonia and nearby communities, while discriminating against communities distant from the dump. Either funds must be made available to all six of the municipalities on Pohnpei Island, or a more even distribution of the infrastructure provided by the funds spent at the state level must be achieved.

21.5 CHANGE SINCE 1997 REPORT

The Report describes a situation that remains very similar today. In Pohnpei, the efforts of PWMS have improved the Dekehtik site and provided commercial waste collection and disposal

to customers needing such services. I am not aware of any other private commercial enterprise dedicated solely to waste management in any of the other FSM states.

I cannot provide comment on the Wastewater section.

Comments on the Report:

1.1 – last paragraph: Roles of the states and the national government should be clarified. The actual daily handling of solid waste might be best considered a state level task, while the testing of lagoon waters for pollution would be among the national licensing and regulatory responsibilities.

Is a copy of the 1993 document available?

1.2.2 –

- Littering and indiscriminate dumping have increased.
- As of 2001, PWMS has four years of experience providing collection services.
- The Kolonia Town service is no longer available. The estimated cost of the town's two collection trucks could have purchased the services of a commercial collector for more than seven years.
- Operational changes at the Dekehtik site have been mentioned previously.
- The cost of the operation has been reduced to \$85,000 per year. With a multi-year contract we believe that it could be reduced more.
- Moving the dump to the proposed new site in Palikir, is still a possibility. Situated in the mangrove swamp, the present site is unsatisfactory from an environmental perspective, and other uses for this location have been suggested.
- Kolonia Town is doing limited collection of aluminium cans. PWMS has also explored this possibility and believes that a recycling effort could be sustainable and provide employment opportunities.
- The composting operation at the Agricultural Station is no longer running.

1.2.3 –

- Janitorial Services at the hospital have been privatised and medical wastes are brought to the dump for incineration. PWMS provides the incineration services. At this time, the private clinics and other medical clinics do not utilise this service.
- Waste oil is being stored in drums and a tank. Methods of possible disposal being investigated by PWMS include burning, and processing through a filtering system to produce reusable oil.
- Batteries are now segregated and stored on pallets under a shelter. Final disposition is not known at this time.
- During the past three years incineration of quarantined items have been provided on several occasions.

21.6 OTHER ISSUES

The stockpile of unused chemicals at the Agricultural Research Station in Kolonia is still there.

A plan to construct an electric generation plant and tank farm at the Dekehtik location has been proposed. Perhaps this is a catalyst to relocation.

