

THE SANITATION PARK PROJECT

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SOPAC Secretariat

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SOPAC Technical Report 386



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A REGIONAL INITIATIVE TO INCREASE PARTICIPATORY APPROACHES IN THE SANITATION SECTOR

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SOPAC Secretariat

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A big *vinaka vakalevu* to:

- The Fiji Ministry of Health (MoH), the national agency responsible for design, implementation and monitoring of rural water supply and sanitation projects and programmes in Fiji. MoH played a significant role in the Project, linking it with the communities in Fiji through their network in the various districts.
- The World Health Organisation (WHO), the UN agency responsible for environmental and human health, and poverty alleviation through improved water supplies, sanitation and hygiene. In addition to providing funding, WHO was also a key partner in providing technical support from the Project start.
- The Fiji School of Medicine (FSchM), the regional organisation responsible for the training of Environmental Health Officers for the health ministries of Pacific islands governments. We would like to thank FSchM for accepting the Sanitation Park to be part of their School Campus linking it with the students and its associated training programmes.

Other partners to whom we would like to pay tribute include:

- Rakesh Dayal and his team for the excellent work in constructing the systems at the Park and also assisting in facilitating training when called upon;
- John Robinson for the artwork provided for the signs; and
- Graphic Systems for professionalism in delivery of the signage, a sample is pictured on the title page of this report.

We sincerely thank the communities of Keiyasi, Balevuto and Nadelei for welcoming us into their villages and homes and for their role and cooperation in the Project.

Though the Project Team was inclusive of officials and representatives of the World Health Organisation, Fiji Ministry of Health, the Fiji School of Medicine; and SOPAC, the officials making up the core Sanitation Project Team were:

Dr Keshwa Nand	– Fiji School of Medicine
Mr Navi Litidamu	– Fiji School of Medicine
Mrs Vasemaca Naulumatua	– Ministry of Health
Mr Timoci Young	– Ministry of Health
Dr Leonie Crennan	– SOPAC
Ms Rhonda Bower	– SOPAC

1: PROJECT EXECUTIVE SUMMARY

A genuinely grassroots undertaking with full community involvement, the Sanitation Park Project is designed to provide support to communities in Fiji in identifying and solving their sanitation problems by examining and selecting from a range of appropriate, affordable wastewater treatment options housed at a demonstration park located at the Fiji School of Medicine, Tamavua Campus.

The Project Team including the World Health Organization (WHO), Fiji Ministry of Health (MoH), Fiji School of Medicine (FSchM) and the South Pacific Applied Geoscience Commission (SOPAC) worked together to implement the Project with funding provided by WHO and the New Zealand Agency for International Development (NZAID).

Three rural communities namely Keiyasi (Sigatoka), Balevuto (Ba) and Nadelei (Tavua) were selected as suitable locations for Project implementation through pre-project surveys. This included hands-on training for the construction of a composting toilet in May 2004 involving district health workers and community members; and three community Workshops under the WHO “Healthy Islands Initiative”. The Workshops in the three communities assisted them to develop action plans using the Healthy Islands process, which will be managed by the local health officers in the future.

The Project, although implemented in Fiji, has regional application through adopting technologies that are applicable to other countries within the Pacific and the location of the Sanitation Park at a regional training institute – the Fiji School of Medicine. FSchM will use the Sanitation Park as a training tool and the information will be available to regional students undergoing health services training there.

FSchM will manage the Sanitation Park and use it in appropriate training programmes both for its students and for other members of communities, schools and other teaching institutions and leaders. The Sanitation Park can also be used for awareness raising and training purposes by other groups promoting appropriate technology in sanitation.

2: BACKGROUND

Government bodies and the public have tended to give little attention to sanitation issues in the Pacific. This complacency and subsequent lack of investment has led to inadequate development in the sanitation sector. The result is an absence of good training facilities for Health Workers and Technicians, with health education in the community suffering in particular. Ultimately, there have been serious health consequences for the community. The lack of awareness of the importance of appropriate excreta disposal leads to little or poor maintenance of existing sanitation facilities, resulting in low standard waste disposal systems.

As a result of the above, sanitation related diseases are prevalent in the community, predominantly in rural areas and squatter settlements, where poverty is rife. Ultimately the marine environment, water resources and sub-soil suffer due to dangerously high levels of faecal contamination.

Overall Objective

Reduced number of sanitation related diseases, reduction in the pollution of the marine environment, water resources and sub-soil in the Pacific.

Purpose

To assist communities in the implementation of appropriate excreta disposal technologies whilst developing the skills of health workers, sanitation technicians and students of Environmental Health.

Outputs

- Sanitation Park containing various demonstration wastewater treatment systems located at the Fiji School of Medicine, Tamavua Campus.
- Hands-on composting toilet construction training in May 2004 involving district health workers and community members from three selected communities namely Keiyasi (Sigatoka), Balevuto (Ba) and Nadelei (Tavua).
- Community Workshops in June 2004 under WHO/MoH “Healthy Islands Initiative” in Keiyasi (Sigatoka), Balevuto (Ba) and Nadelei (Tavua).
- Multiplier effect with replication in other Pacific island countries (through the regional students at FSchM).

Target Group

Beneficiaries of the Project included the communities of Keiyasi (Sigatoka), Balevuto (Ba) and Nadelei (Tavua), District Health workers in the three selected communities and FSchM students from various faculties.

Fiji was specifically the focus of this Project because it is the only island (apart from Papua New Guinea) that has the facilities to train sanitary engineers. There is also a distinct lack of community-based sanitation work going on in Fiji.

Project Duration

April 2000 – December 2004

3: PROJECT ACTIVITIES

The Project was implemented by the Project Team in two distinct components: (1) the Sanitation Park containing various demonstration models of wastewater treatment systems with the associated signage; and (2) the Community Programme, which included the hands-on composting toilet construction training and community workshops under WHO's "Healthy Islands Initiative" banner.

Prior to the Project implementation however, pre-project surveys were carried out in early April 2000 to identify communities in which the Community Programme component would be carried out.

The various activities carried out during the course of the Project are elaborated on below:

Pre-Project Surveys

A quantitative justification was required for Project implementation in the chosen communities, as there was an unclear picture of community status with regards to sanitation in Fiji during the initial stages of the Project. The quantitative justification was obtained by carrying out surveys for more detailed and accurate data from the communities throughout Viti Levu, Fiji, from 1 to 30 April 2000.

The pre-project surveys were carried out in order to determine the extent of sanitation-related problems in the various communities. At this stage, the Project Team relied on the local knowledge of its partners (Fiji Ministry of Health and the Fiji School of Medicine) to identify communities in Fiji that were known to have sanitation problems. Potential locations were considered in the rural interior, rural coastal, and squatter settlements of Viti Levu.

District Health offices in Ovalau, Kadavu and the Western and Central divisions of Viti Levu, were contacted by the Ministry of Health in early 2000 and asked to identify communities that are experiencing sanitation problems. A checklist was sent out to district offices with set questions regarding the present sanitation situation in the communities. Each office was given two weeks to complete the checklist and identify three 'problem' communities consisting of a rural interior, rural coastal and a settlement community. The exercise resulted in the identification of 14 communities on Viti Levu in which the surveys were carried out.

The objectives of the pre-project surveys being to:

- identify the sanitation problems that exist within the problem communities;
- determine the level of priority that the communities attribute to their sanitation problems; and
- determine the extent of sanitation-related disease in the problem communities via recall as well as clinic data.

The surveys consisted of three components: household questionnaires; GIS data gathering; and water quality testing. Results from the survey in fourteen communities around Viti Levu, Fiji were analysed to assist with identifying three communities to be targeted for Phase 1 of Project implementation (*see Annex A for Pre-Project Survey Results*).

On review of the results, three villages were recommended as the most appropriate for actioning Phase 1 of the Project, these being Balevuto in Ba; Keiyasi in Sigatoka; and Nadelei in Tavua. Important criteria in taking this decision included communities identifying sanitation as a priority for community development.

Phase 1

Phase 1 of the Sanitation Park Project involved the Project Team carrying out the most substantial part of the Project, which included the following:

Sanitation Park Construction of the demonstration wastewater treatment systems (March 2003 – November 2003)

The “Sanitation Park” is a demonstration of a range of systems, beginning with low technology facilities to progressively higher-level treatment systems, in a “sanitation ladder” of available treatment and disposal options. The “Park” provides an opportunity for interested community members, students, leaders and community health workers to examine how the wastewater treatment options work to treat excreta and protect human health.

The Project Team had initially considered employing a construction company to design and construct the Park but it was decided it would be a more effective learning experience for all concerned if the Project Team undertook design and installation themselves.

Project Team members contributed to the designs for various systems and discussed the layout for the Park. A local builder was hired to undertake the construction. The site provided by FSchM was challenging as it was in a small steep gully at the back of a public clinic. Initially it was decided by the Project Team to locate the sanitation systems around the edge of the gully, in a manner, which would simulate a village setting and allow access to the systems for inspection. The systems would then be connected with a path to allow users’ comfort and easy access when viewing the systems. The layout was later modified because of the difficulty and cost of construction in the gully in the very wet conditions that occurred in Suva in March and April 2004. Consequently the systems were all built close together on one side of the gully.

Unfortunately the ventilated pit latrine VIP was built next to the sanitary well. This was corrected with signage and fencing. It was initially planned that the well be sited next to the CT, as it is one of the advantages of the CT that it can be close to water sources without causing contamination. The septic tank was also sited close to the VIP and was separated through a partition. Appropriate signage has been developed for each system making it clearer.

The systems at the Park have been developed to provide an interactive learning environment featuring cut-away and viewing portals in the various systems to provide maximum communication between viewers and the system. Viewers will also comprehend actual sizes of the systems and get a feel for material used. Additionally the systems will serve as a technical training tool for use by FSchM in their teaching programme with their students.

Sanitation Park Signage

The signage created for the different systems were primarily developed based on ideas of the Project Team with some input from participants of the Hands-on Training at FSchM in May 2004.

Several considerations taken into account when developing the signs are outlined below:

- Language, agreed signs would be in English to accommodate the fact of limited space on signs. Any translation would be taken on board by FSchM in their future training programmes, on material to be developed by them to complement the systems;
- Information on materials, costs, operation and maintenance should also be included in signs. Again due to limited space this could not be accommodated but can be taken up in the future by FSchM for any further material development;
- Cross-section diagramme of system, showed various parts and how they worked;
- All signs were standardised in design, color, font and style; and
- Signs accommodated features to combat weathering and vandalism as much as possible.

After the concept was developed, much consultation was carried out by the Project Team to agree on final signage information and presentation. This was then taken to a professional sign making company (Graphic Systems) to transform the ideas and concepts to actual signage output. This whole process took around six months. The Project Team also solicited the support of a free-lance artist John Robinson to provide necessary artwork for some of the signs.

The final product for signage was computer generated and printed on PVC and installed at the park site with supervision by the Project Team in November 2004.

The Community Programme of the Sanitation Park Project

The goals of the Community Programme of the Sanitation Park Project were to provide accessible information on the comparative value of a range of common sanitation systems, including design, appropriate location, preferred and alternative materials, cost to build, maintenance requirements, health benefits and risks. It was intended that community participation in this programme occurs in three stages:

- *Hands-on Composting Toilet Construction Training in May 2004 involving district health workers and community members from three selected communities namely Keiyasi (Sigatoka), Balevuto (Ba) and Nadelei (Tavua).* This experiential training allowed participants, including district health workers and community members, to construct a composting toilet with a view to participants returning to their villages and work places with these skills and knowledge and sharing these experiences with their respective communities (see Annex B: *Hands on Training Workshop Participants List, May 2004*).
- *Community Workshops held, June 2004, under WHO/MoH "Healthy Islands Initiative" in Keiyasi (Sigatoka), Balevuto (Ba) and Nadelei (Tavua).* The workshops facilitated by the Project Team in the communities, built upon the hands-on-training held in May 2004, supported the Sanitation Park construction. The main purpose for the community workshops was to mobilize the village participants to develop action plans under the "Healthy Islands" approach and used this as an opportunity to highlight wastewater issues (see Annex C: *Community Workshops Participants Lists, June 2004*).
- Ongoing inspections and demonstrations at Sanitation Park for the public and environmental health students.

Hands-on Composting Toilet Construction Training, Suva, 7-11 June 2004

The Hands-on Composting Toilet Construction Training commenced on 7 June 2004 with the arrival of the course participants in Suva. The Project Team met with the participants to welcome them, to provide them with protective clothing such as overalls, gumboots and hard hats for construction work, and explain the course programme.

The participants included a community representative elected from each of the villages of Keiyasi, Balevuto and Nadelei and a District Health Officer from each of their districts.

On 8 June 2004 the participants assembled at FSchM, Tamavua Campus, and an introduction was provided by Project Team members Mr Navi Litidamu, Senior Lecturer/Assistant Head of School Administration, School of Public Health & Primary Care at FSchM and Mr Timothy Young, Senior Health Inspector, from the Ministry of Health (MoH). A number of students from FSchM joined the training and over the three days the number of participants fluctuated between 12 and 25. Two Peace Corps Volunteers participated as observers. A senior member of Vunisinu Village (Rewa), Mr Pita Vatucaawaqa, accompanied one of the Peace Corps Volunteers as they planned to install and trial a 'Wheelibatch' composting toilet in his village as part of the International Waters Project.

The participants were shown around the Sanitation Park site where the following demonstration systems had been constructed over the preceding eight weeks:

- sanitary well;
- a ventilated improved pit latrine (VIP);
- a septic tank and soakage trench with viewing portal; and
- the foundations and partially-completed concrete block work chambers of an alternating batch composting toilet (CT) or organic toilet.

The goal of the hands-on training was to provide the technical skills to build a composting toilet in their village, or to build the systems for others as an income-generating activity if desirable. The training focussed on completing the composting toilet, as this was an unfamiliar sanitation system in Fiji.

The participants from the three villages were informed that, in the second component of the community programme for the Sanitation Park Project, when the Project Team visited their villages as part of the Workshops under the Healthy Islands Initiative, they would be required to present what they had learnt during the construction training. This would also serve to reflect what they had understood from the training and what they had considered to be useful and important.

Despite constant rain and muddy conditions at the site, the participants constructed the following CT components over two days:

- drainage system from plenum floor of the composting chamber to a blockwork trench which was lined with plastic sheeting and filled with aggregate and stones;
- treated pine slat false floor in composting chamber;
- access door to the composting chamber, with baffles to allow inspection without contact with the composting pile; and
- toilet room floor with toilet pedestal and ventilation.



Figure 1:
Community representatives,
FSchM students and Health
workers during the hands-on
composting toilet training at
FSchM, Tamavua Campus, Suva.

The builder, Mr Rakesh Dayal, took an active role in allocating tasks and demonstrating construction. He then supervised while the participants built the components of the system. Mr Dayal is a competent builder and encouraged the participants to produce quality work. He had not acted in this teaching capacity previously but demonstrated patience and skill in this role. The Consultant, Leonie Crennan, supervised the overall design and instruction process but few interventions were necessary as the participants worked enthusiastically under Mr Dayal's direction and asked many questions.

In the group there was one female Environmental Health Officer and four female trainee health officers. As the men were inclined to step forward first to undertake the carpentry and masonry work, the women were given the task of constructing the drainage trench for the second composting chamber. In addition to this specific designated task, they observed the building process and asked questions with the other participants.

A fibreglass toilet seat or pedestal had been purchased by SOPAC from the Development Officer at the Central Planning Department in Tonga to use on the demonstration model. However the design needs to be modified and a mould made for production of pedestals for general use in Fiji. On the third day, an indoor session reiterated the principles of construction and maintenance of the ventilated pit latrine, the septic tank, the sanitary well and the CT.

To reinforce understanding and management of the CT, the design of two different types of CT's were discussed, and a short video was shown of alternating batch toilets being maintained in rural and urban settings in Australia. This was followed by a DVD entitled 'Water Tomorrow', produced by the Asian Development Bank, with assistance from SOPAC, which examined efforts in Tonga and Kiribati to deal with contamination of ground water from domestic rubbish and human excreta. A variety of approaches, which involved communities in more responsible and informed environmental management were demonstrated. In the discussion following these presentations, the participants covered the following issues:

- It was useful to know that environmental health officers and community members were tackling the same problems in Tonga, Kiribati and Fiji, and that various methods of community participation and education were being tried.
- Seeing families using the CT in Australia demonstrated that there is also a need for this kind of toilet in developed countries, and the system can be modified for use in a modern urban house or a rural setting.

- The main obstacle to implementation of the CT in the villages would be maintenance such as collecting and using the leaves to be added as a carbon/nitrogen mix, and emptying the compost at the end of the decomposition process.
- The CT would be very helpful in villages where there was a water supply problem.
- How could the CT seat be cleaned as water should not be put down the toilet, and would there be a problem with drainage if people who used it had diarrhoea?
- What would happen with the CT in a flood?

Following the session on management of the CT, details on construction and maintenance of the VIP, the septic tank and trench, and the sanitary well were presented by Mr Keshwa Nand, a Project Team member and Lecturer School of Public Health & Primary Care at FSchM.

In addition to the hands-on training, a field trip was also organised to a settlement in Suva called Makoi to inspect an alternating batch CT built by Greenpeace in 1996. The system used fishing net instead of a timber false floor to support the compost pile with the net being removed when the compost is ready to be emptied. There had been reports that the CT was not popular with the local residents and it was intended to ask them what their experience of the system had been. However there were not any residents available for discussion at the time of the visit. It appears that the fact that the CT was a communal unit was a disincentive for maintenance. This is a common experience with CTs in other locations in the Pacific and it is recommended that a CT be used in an individual domestic context unless it can be guaranteed that it will be maintained by designated person/persons.

The group also visited the Vector Control Centre where concrete toilet pedestals for pour flush and pit latrines are cast.

After the field trip the group returned to FSchM to discuss the presentations that they would be making to their community as part of the workshops planned in each of their villages over the following weeks.

The participants reported that it had been very useful to be involved in a practical interactive training course where they had learnt new technical skills. The next step would be conveying this information to community members back in the village. The participants requested that the media shown to the group as part of the workshops be brought to the village so they could use it in their presentations.

Community Workshops held in June 2004 under WHO/MoH "Healthy Islands Initiative" in Keiyasi (Sigatoka), Balevuto (Ba) and Nadelei (Tavua)

During the preceding months the two-day village workshops had been planned through coordination with the District Health Officers in the MoH. The MoH planned to conduct the 'Health Promoting Communities (HPC) Workshop' in the village, as part of the Healthy Islands (HI) programme, and 'Sanitation Park' would be a component of their environmental health discussion and promotion. A collaborative effort with these fieldworkers, who had developed an ongoing working relationship with the communities, was seen to be an effective way to introduce Sanitation Park and associated personnel to the community, and also to integrate sanitation into the environmental health of the village as a whole.

The aim of the Healthy Islands Programme is:

- to develop an understanding of the design and principles of the Health Promoting Communities programme;
- to familiarise village participants to the five steps and six action areas in the healthy islands approach;

- to establish a Health Promoting Community or village;
- to identify factors which influence health-promoting practice in the villages; and
- to recognise the contribution of villagers and stakeholders in health promotion.

It was planned that, on the second day of the two-day Workshop, each village would prepare an action plan based on the discussions on the first day.

It was agreed that the SOPAC and FSchM Team members take a supportive role in logistics, provision of multi-media and technical advice if required, while the local officers would facilitate the workshops in co-operation with community leaders and participants.

Keiyasi Workshop 15-17 June 2004



*Figure 2:
Keiyasi women
involved in discussion
and planning during
their two-day
workshop.*

On June 15 the Project Team travelled from Suva to Sigatoka and met with the district environmental health officers at the Ministry of Health office. The Project Team then travelled to the village of Keiyasi deep in the Sigatoka Valley and met with the Village Spokesman who was an active participant during the two days of the Workshop.

A Women's Church Group provided meals and the Team was billeted in homes in the village. A second group of women took care of catering on the second day, which meant that the responsibility and the funding was shared around. This involvement also ensured that the whole village was aware of the Workshop.

Representatives from three other villages besides Keiyasi also attended the Workshop. There were 43 participants from Keiyasi, Navula, Sawene and Edrau. A Peace Corp Volunteer from the Provincial Office at Korovou attended as an observer (he had also been at the training in Suva for half a day) and he planned to pass on information about the sanitation systems to other environmental and coastal protection programmes in the district.

On June 16, the Workshop opened with prayers and a sermon by the local Pastor focusing on the connection between cleanliness and godliness, followed by an introduction by Mr Timothy Young. Ms Vasemaca Naulumatua, Project Team member and Health Inspector from Nadi (Ministry of Health) explained the Healthy Islands Programme. Threats to environmental and public health were raised such as poor drainage, inadequate disposal of rubbish and the impact of domestic animals within the village.

Mr Mesake Biunaiwai, the Headman of Keiyasi, who had been a participant at the training in Suva, then presented his understanding of the demonstration models at Sanitation Park, and in particular the construction of the CT using a slide show prepared by the Consultant. The local District Health Officer, Mr Penioni Cagilaba who was also present at the hands-on training, assisted him. Discussion and questions followed such as:

- Should the dry leaves be kept close by the CT? *Yes.*
- How long does the waste take to decompose? *Six to twelve month.*
- What happens to the compost if you have diarrhoea? *The pile will absorb it.*
- What kind of toilet paper can you put in the toilet? *Anything that will decompose.*
- Can you use detergents to clean the inside of the toilet seat? *Just use a rag with a stick and drop it in the toilet or wipe with vinegar or bicarb of soda.*
- Is there a plastic container inside the hole? *No.*
- How many years will the toilet system last? *The same time as a concrete block house if it is properly built.*
- Can ash be used instead of dry leaves? *Yes but best to use dry leaves as well.*
- Why are you promoting the CT and how can this toilet be built in our village (funding, materials etc?). *To provide a choice, and assistance can be requested through the usual procedure where government/village share cost on a two thirds/one third basis.*

It was observed that both women and men were actively involved in the discussion and the women asked many of the questions.

The DVD, “Water Tomorrow” and video footage of CTs in Australia was also shown at the Workshop. The village generator was required when this media and Power Point presentations were being shown.

In the last session of the first day the community representatives were requested to prioritise the environmental issues in their village, which required attention. This was in preparation for their Action Plan to be developed the following day. A representative from each village then presented their priorities to the Workshop. All villages had improved toilets and water supply in their list of priorities.

On the second day, 17 June 2004, two medical students from FSchM presented a village profile of Keiyasi, which they had developed from a survey conducted in previous months. The Sanitation Park Project could be incorporated into this component of the FSchM student programme by including the student survey of Keiyasi in the Project. This data included number and type of toilets in a percentage of houses, drainage problems, and certain diseases detected in the surveyed group, such as diabetes, skin disorders, elevated blood pressure and obesity. For the rest of the day, the community representatives developed their Action Plan, which included time frame and persons responsible to undertake remedial, or development initiatives. A representative from each village then presented their action plans to the other Workshop participants (*see Annex D for Keiyasi Action Plan*).

Mr Timothy Young closed the meeting by commenting on the prevailing attitude that it was the Government’s responsibility to solve the environmental health problems in the village. He asked the question “who is the Government?” and pointed out that it is actually people like himself and the Environmental Health Officers present at the meeting, and that the solutions can only come from the community itself, with the support and understanding of Government personnel.

A quick evaluation of the Keiyasi Workshop was carried out by asking the participants to provide feedback on the Workshop. Comments from the Village spokesman and other participants included the following:

- The people were not aware that allowing animals loose in the village would create health problems, as it was the norm to allow pigs and horses in the village.
- New knowledge had been brought to the village about decreasing the number of sick people taken to the hospital by improving hygiene conditions in the village including proper rubbish disposal and animal management.
- The CT is useful to know about and totally new – good to know that the system will last for many years.
- Helpful to learn how to develop an Action Plan – ongoing support is needed and it would help if health officials return to see the improvements the village has achieved as a result of what they have learnt during the Workshop.
- The Workshop could have been improved by hands-on training for building CTs in the village, and in general to provide live/real demonstrations to assist the participants to grasp the objectives of the Workshop – consideration should be given to the “poor educational background” of the villagers.

Observations made by the Project Team during the Workshop include the following:

- Participation and involvement in the Workshop appeared to be assisted by the active presence of the Chief for the whole event, and the attendance at the Suva training by the Head Man and his subsequent presentation to the Workshop.
- Billeting of the Project Team in the village for three days allowed some relationships to be developed between Project personnel and the community and this appeared to also assist with interest and participation.
- Participants were more likely to ask detailed questions especially about the CT when the opportunity for informal contact occurred throughout the meeting e.g. during meal times or during the small group discussions – twelve participants approached the Consultant to discuss the CT, in English, over the two days.
- Keiyasi only had reticulated water for a couple of hours a day, and households had to pay for their water usage, so a toilet, which did not use water, and did not need to be moved around (such as is required with a pit latrine) had immediate practical appeal.
- News about the CT spread through the village after the first day and additional participants attended on the second day. As there were no further presentations about the CT on the second day, information was provided outside the meeting. People were interested in building the CT at their homes in the Keiyasi District and on their home islands such as the Yasawas. Saving water seemed to be the main motivation.
- Both women and men were actively involved in the Workshop asking questions, making comments and presenting their Action Plans.
- It appeared that the sanitary well, the VIP and the septic with soakage trench required more emphasis in the Workshop so that people understood that these systems also needed attention to be properly designed, located, constructed and maintained.

Keiyasi did not seem to have sufficient understanding that any kind of sanitation systems should be properly constructed and maintained in order to maintain public health and protect the environment. This includes the essential requirement for septic (and soakage trenches) and pit latrines to be safely located in relation to water resources and human activities.

Taking this into account, this aspect of the Sanitation Park and any further related training needs should be strongly emphasised, demonstrated and discussed to ensure understanding.

It should be noted that the same principles of adequate treatment and location applies to discharge from a reticulated sewerage system.

Balevuto Workshop, 21-22 June 2004



Figure 3:
Ba Environmental
Health officers present
at the Balevuto
Workshop

Representatives from the nearby villages of Toge and Nadrugu joined the Balevuto community members for the Workshop. The communities grew sugar cane, pine trees and vegetables.

On June 21, the Workshop opened with an *isevu sevu* followed by an introduction by MoH officers, Mr Timothy Young and Ms Vasemaca Naulumatua, explaining the Sanitation Park concept and the Healthy Islands programme. The rate of decomposition of various types of rubbish was discussed. Some participants commented that the local Ministry of Health clinic was untidy, so that should be cleaned up first before Environmental Health Officers gave advice about rubbish in Balevuto. It was pointed out to them that the clinic was part of the community's responsibility.

Environmental Health Officer, Mr Vitale Varo, presented a profile of the three villages. He had attended the Sanitation Park training in Suva so he then presented the slides of the CT construction. The community representative Mr Samisoni Tukana who had attended the training was reluctant to speak. While he had been actively involved in the CT construction he was unable to present what he had learnt to his community in the formal context.

There were problems with lighting in the community hall where the Workshop was held so it was not possible to show the video of Australian CTs as the VCR did not work and the DVD 'Water Tomorrow' was shown but it was very difficult to see.

Questions that followed after the CT presentation included the following:

- How can we get funding to have a CT built in the village to try it out? *Need to follow the procedure through the District Officer;*
- What are some of the problems that can happen with the CT? *The system should be kept dry, and dry leaves have to be collected to use in the toilet; and*
- What happens if we use water? *The system will not compost the waste and it could smell.*

The participants then broke into their village groups and prioritised the issues that needed attention in the village. Water supply and toilets were listed but septic tanks were the desired option.

Part of the Project Team stayed back in the community after the Workshop was completed on the first day resulting in further discussions with other community members. This resulted in the slide show about the CT construction being shown again at the opening of the second day.

For the remainder of the day, the community representatives prepared the action plans for their villages. Toilets and water supply were listed as priorities but flush toilets with septic tanks were the desired system. Ms Naulumatua was unable to attend on the second day so the activities for developing the Action Plan were coordinated by the local District Health Worker. The action plans were presented back to the larger group at the end of the Workshop (see *Annex E for Balevuto Action Plan*).

There was no formal evaluation of the Workshop by the participants but there generally appeared to be less participation and interest than was shown at the Keiyasi Workshop.

This could have been influenced by a number of factors such as:

- The local Chief did not attend the Workshop.
- The community representative at the Sanitation Park training was not a senior member of the village and it appears he had not informed the village about the training, as most participants did not know what the Workshop was about.
- The Project Team did not stay in the village and so there was little time to make a connection with the community. The overall relationship did appear to improve on the second day following several members of the Project Team staying back to socialise in the community the previous evening.
- The male participants drank kava throughout the whole Workshop;
- The women remained at the back of the hall and only became involved during the development of the Action Plan. It appeared that most of the women of Balevuto were engaged outside preparing the lunch and morning and afternoon tea.
- Once again the issues associated with proper use of septic tanks, VIPs and sanitary wells did not appear to have been absorbed by the participants.

As in the case of Keiyasi, Balevuto also did not seem to have sufficient understanding that any kind of sanitation systems should be properly constructed and maintained in order to maintain public health and protect the environment. This includes the essential requirement for septic (and soakage trenches) and pit latrines to be safely located in relation to water resources and human activities.

Taking this into account, this aspect of the Sanitation Park and any further related training needs should be strongly emphasised, demonstrated and discussed to ensure understanding.

It should be noted that the same principles of adequate treatment and location applies to discharge from a reticulated sewerage system.

Nadelei Workshop, 1-2 July 2004

The final in the series of community Workshops was held in Nadelei on the 1st and 2nd of July 2004. Representatives from the nearby village of Waikubukubu also joined the Nadelei community members for the Workshop.

On July 1, MoH officers, Mr Timothy Young and Ms Vasemaca Naulumatua explained about the Sanitation Park and the WHO Healthy Islands Programme; opening the Workshop in a similar fashion to the two preceding workshops with an *isevu sevu* followed by an introduction.

The Workshop in Nadelei was different in that there was a stronger FSchM presence than the previous two workshops with Mr Navi Litidamu, Mr Nemani Seru and three active FSchM students who had formed strong links with the community while working in the area as part of the FSchM student programme. The three FSchM students presented the village profile for Nadelei back to the community. It was seen that FSchM took the lead on facilitating the group work and action plan development for the Workshop in Nadelei.

Additionally, the community representative Mr Semi Koroi, who had attended the hands-on training in May was a strong advocate for the programme in the community and had briefed them already on what he had learned prior to the Workshop, which complemented and supported the Workshop programme.

Following on from what the FSchM students had presented, Mr Koroi then made a brief presentation to the Community on the training he received during the CT construction training using the slide show prepared by the Consultant.

In the case of Nadelei, the community hall was dark enough to allow the screening of the DVD, "Water Tomorrow" to be effective which allowed the community to see experiences from Tonga and Kiribati.

For the remainder of the day and the beginning of the second day, the community separated into their various villages and prepared the Action Plans for their villages accordingly. This was presented back to the larger group at the end of the Workshop (*see Annex F for Nadelei Action Plan*).



*Figure 4:
Group discussions and
formulating action plan at
Nadelei Village.*

There was no formal evaluation of the Workshop by the participants but general impressions by the Project Team was that there appeared to be a lot more participation from the community, similar to what was shown in Keiyasi.

This could have been influenced by a number of factors such as:

- The community member involved in the hands-on training exercise was a respected member in the community and carried the information to them following on from the training which supported the Workshop programme when carried out later in the community.
- The FSchM played a leading role in the development of the action plans and facilitated a lot of the discussion between community members and community members and the Project Team.

- The venue and environment in which the Workshop was carried out supported the smooth running of the programme, e.g. dark hall for DVD, direct access to electricity.
- Kava was drunk during the *isevu sevuu* ceremony then ceased during the actual Workshop programme.
- Although the women were involved in the preparation and serving of food they had also organised themselves to also be able to participate in the Workshop programme as well.
- The programme was amended somewhat to incorporate issues associated with proper use of septic tanks, VIPs and sanitary wells, which was not delivered as effectively during the previous two community workshops.

Sanitation Park Opening Ceremony, 18 November 2004



*Figure 5:
Acting New Zealand High
Commissioner, Ms Joanna
Kempfers and Dr Sitaleki
Finau of the Fiji School of
Medicine, at the opening of
the Sanitation Park.*

The Sanitation Park Opening Ceremony held on 18 November 2004 was crowning glory event of the Sanitation Park Project, completing the implementation of all its components.

The Chief Guest for the Opening was Ms Joanna Kempfers, Acting High Commissioner, New Zealand High Commission, who provided an insight into NZAID Health Policy and links with a Project like the Sanitation Park for which it partly funded together with WHO.

The Opening Ceremony provided an opportunity to showcase the Park to the general public from various sectors. Guests provided interesting feedback – one mentioned that they never actually knew nor thought much about what happened after the “waste” disappeared down the toilet, which was the desired effect.

4: PROJECT CONCLUSIONS AND RECOMMENDATIONS

From concept to implementation the Sanitation Project took four years to carry out, with funding being secured at various stages of the Project.

Generally, the strengths brought to the Project Team by the various partners allowed for the various components to be implemented in an effective manner with each partner providing the skills needed to deliver on the various components (see *Annex G for Project Partners MOU*).

The following recommendations and conclusions can be drawn from the various components:

Recommendations from Construction of Sanitation Park

It must be noted that these recommendations are being made in the context of the construction of the Sanitation Demonstration Park at the Fiji School of Medicine, Tamavua Campus and does not in any way apply to community experiences.

The construction of the Sanitation Park and the development and installation of signage took one year to implement. Recommendations by the Project Team for this component of the Project include the following:

- In the Project planning stage, account for more time (at least six months) for construction than originally planned as experience from the Project has shown that time taken for construction over-ran the original plan by several months.
- Budget in more than planned for, when dealing with construction, as prices often fluctuate which can significantly affect budgets and often there is more work and materials required than was originally planned for once construction gets underway and unfolds.
- A skilled, innovative and reliable builder is an important quality to deliver on construction of Projects. We were fortunate to have been able to secure Mr Rakesh Dayal for the Project who in addition to carrying out work specifically outlined in his TOR, also facilitated training when called upon during the hands-on training exercise.
- Contracting out construction for the building of systems under the supervision of the Project Team worked out well with the SOPAC purchasing materials from local supplier (GMR) for builder on request to carry out work at site. From this experience, we recommend the use of a skilled, innovative and reliable builder be considered for the construction works with the Project Team purchasing materials for construction when needed.
- There is a need to develop a seat or pedestal for use with CTs in Fiji. The seat should be easy to move when the first chamber is full, and manufacturer to also provide a hygienic seal for the first chamber when the seat/pedestal is installed above the second chamber.
- When dealing with several individuals in a Project Team discussing issues with regards to signage information, system features and design, it is important to note that this is time consuming and needs to be accounted for in a Project timeline. Extra time should also be entertained for this component because final products will be in place for a long time and is often difficult to change when in place.

Recommendations from the Community Programme

The community programme included the Hands-on Composting Toilet Training at the Sanitation Park and the subsequent community workshops in Keiyasi, Balevuto and Nadelei. Lessons learned by the consultant and the Project Team during the community programme are outlined below:

- Practical hands-on training is an effective way to promote a sanitation system and convey the principles behind the approach. People are empowered by learning technical skills and knowing that they can make well-informed choices, and that they can construct and maintain the systems themselves.
- Where it is necessary to provide additional or background information to trainees it should be short (not more than 30 minutes) well-illustrated presentations preferably with a human story line e.g. children using the system or dealing with problems of maintenance etc.
- Power Point presentations should be carefully used to enhance the information presented through the use of photographs and clear relevant diagrams, but not as a substitute for engaging communication. Using Power Point to present lengthy text or impersonal data can create a barrier to understanding and interest in any culture.
- Where media such as DVDs and video are shown the equipment should be tested in advance, in the Workshop setting, so that the participants are not left waiting while technical problems are solved.
- Having trainees present what they have learnt to their community is an effective method to reinforce and clarify the message, but it is also important that the trainee has the confidence and ability to explain the information in a public setting.
- Overall participation and understanding in a community appears to be increased by the active involvement of women in the practical training, discussion and decision-making. It may be necessary to ensure that women are not prevented from attending the Workshop because they are taking care of the catering.
- Staying in a village for a number of days and working through the village leadership and established networks can increase the potential for interest and involvement by the community.
- As every situation is different it is necessary to be prepared for a variety of outcomes in a Workshop context. Participation and effective communication is influenced by many factors, including the personalities and status of the facilitators and the participants who are involved, and their relationship with each other.

The combined recommendations have revealed methods for carrying out similar Projects in the future. Some of the methodology used in the Project can be repeated and other things could be done differently depending on the context of the future situations. These recommendations are not meant to be rigid rules but to be used as guidelines.

Conclusions

The future actions issuing out of the Project will involve communities implementing action plans developed during the community workshops, which will be managed by the MoH in their programmes throughout the various districts.

The long-term management of the Sanitation Park has become the responsibility of FSchM, where the park can be used as a training tool for students and community workers. They will also develop training material to complement the systems at the Park.

Finally, the Park will be open for visitors from communities, schools and other training institutes as it is a very good well-presented tool to use when trying to raise greater awareness of available technologies for wastewater treatment; with its cut-away models and simple signage messages.

ANNEX A: PRE-PROJECT SURVEY INFORMATION APRIL 1ST-30TH APRIL 2000

Viti Levu, Fiji Islands

1. Survey Schedule

The 5-week survey targeted fourteen communities.

Survey Schedule was as follows:

- Week 1: Navua 06/04/00
(Nabukelevu settlement): Population 289
- Week 2: Sigatoka – Nadi 13/04/00
Sigatoka (Malolo Indian Settlement): Population 102
(Keiyasi Village): Population 91
Nadi (Mulomulo Village): Population 138
(Nabila Indian Settlement): Population 222
- Week 3: Lautoka, Ba, Tavua, Rakiraki 17-20/04/00
Lautoka (Vunato): Population 132
Ba (Balevuto) Population 191
Tavua (Nadelei Village): Population 315
Rakiraki (Matainubu Settlement): Population 23
(Naseroi): Population 53
- Week 4: Tailevu 25/04/00, Suva 27/04/00
Tailevu (Vorovoro): Population 154
Suva (Bureta Settlement)
- Week 5: Suva 02/05/00
Matata: Population 230
Nabaka

2. Information Gathered from District Health Offices in Checklists

- Nabukelevu settlement, Serua – situated inland (interior), some (22 km) 2 hrs drive on gravelled (unsealed) road from the main Suva/Nadi Highway. The main source of income is from agriculture, where root crops such as dalo, cassava, and yaqona are grown on a small scale. With a population of over 280 people and 41 households. Cases of diarrhoea, worm infection and skin infection are common.
- Naqelekuga Mataqali, Keiyasi, Sigatoka district, interior, population of 91 with 18 households. 60 km away from main urban centre, Sigatoka, unsealed road. Checklist showed there were 23 cases of diarrhoea over the past two years.
- Malomalo, Sigatoka, with population of 102 and 14 households. 30 km from main urban centre Sigatoka on unsealed road. Checklist showed water supply is from boreholes. Reported 12 cases of diarrhoea over the past two years.
- Vunato, Vitogo, Lautoka, situated in coastal area, with 132 population and 22 households. ½ km from main urban centre, Lautoka. Mainly piped water supply and poor sanitary condition. Cases of sanitary diseases, such as diarrhoea 20, dysentery 15, worm infection (hookworm) 12 and dengue fever 7, over the past two years.
- Nadelei, Tavua situated in the interior, population of 315 with 63 households. 14 km from urban centre, unsealed roads. 18 cases of diarrhoea, most of which are not reported such as cholera, worm infection and dengue.
- Matata, Lami, Suva situated in the interior with 230 people, and 46 households. About 10 km from Suva which is the nearest urban centre on unsealed roads. Cases such as 31 diarrhoea and 20 dysentery were reported in the last two years.
- Vorovoro in the Sawakasa District Tailevu. Situated in the interior with 154 people and 29 households, accessible through unsealed roads. Cases of infertile diarrhoea and dysentery.

3. Pre-Project Survey Team

The Pre-Project Survey Team included, two SOPAC staff, 10 FSchM Students (5 pairs), FSchM Senior Staff member and 1 Ministry of Health District Officer

4. Household Survey Questionnaires

Please return to

Sanitation Park Project Team

VILLAGE SURVEY QUESTIONNAIRE

(Place a tick in the correct space or provide written information where applicable)

Box 1: Village Profile		<i>(to be filled in by project team before the survey)</i>
1	Name of Village:	_____
2	Address:	_____ _____
3	District:	_____
	Tikina:	_____
	Province:	_____
4	Type of Settlement:	
	Rural Coastal	<input type="checkbox"/>
	Rural Interior	<input type="checkbox"/>
	Rural Outer Island	<input type="checkbox"/>
	Settlement	<input type="checkbox"/>
	Other, please specify	_____
5	Turaga ni koro (village spokesman):	_____
6	District Officer	_____
7	Roko (Provincial Representative)	_____
8	Health Officer (name, address, contact no.)	_____ _____
9	Population	_____
10	Distance to nearest urban centre	_____
11	Number of dwellings	_____
12	Type of roads:	
	Sealed	<input type="checkbox"/>
	Unsealed	<input type="checkbox"/>
13	Telephone communication?	
	Yes	<input type="checkbox"/>
	No	<input type="checkbox"/>
	If yes, please state location and contact name and number	_____ _____
14	MAP OF VILLAGE (from Lands Dept.) (show all key structures, topography and geology, presence of env. problems, roads, water resources, shops, church, location and distance of wells, toilets etc; include name of surveyor, date etc on first page)	

Please return to:

Sanitation Park Project Team

VILLAGE HOUSEHOLD SURVEY QUESTIONNAIRE

(Place a tick in the correct space or provide written information where applicable)

Box 2: Household Profile (preferably interview head of household, otherwise another reliable member of household)

1 Name of Head of Household: _____

2 Number in Household: _____

3 Is this an extended or nuclear family unit

Extended	<input type="checkbox"/>
Nuclear	<input type="checkbox"/>

4 Race:

Fijian	<input type="checkbox"/>
Indian	<input type="checkbox"/>

Other, specify _____

5 Age Group and level of education. (Please indicate M & F for male and female respectively)

	None	Primary	Junior Secondary	Secondary	Tertiary
	(Classes 1-6)	(Forms 1-4)	(Forms 5-7)		
5-10 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11-18 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19-39 years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40 years and over	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6 Occupation of income earners in the household:

	male	female
Office jobs, e.g. teacher	<input type="checkbox"/>	<input type="checkbox"/>
Producing cash crops e.g. root crops, vegetables	<input type="checkbox"/>	<input type="checkbox"/>
Raising Livestock e.g. cattle, pigs	<input type="checkbox"/>	<input type="checkbox"/>
Catching/collecting e.g. fish, crabs, shells	<input type="checkbox"/>	<input type="checkbox"/>
Running a store, bakery, boat etc.	<input type="checkbox"/>	<input type="checkbox"/>
Making boats, canoes, handicrafts, etc.	<input type="checkbox"/>	<input type="checkbox"/>

Other, please specify _____

A. Main Water Supply

1 Where does your water supply come from?
(if more than one source, tick all that apply)

a) Unmetered pipe water supply	<input type="checkbox"/>
b) Metered	<input type="checkbox"/>
c) From a communal standpipe	<input type="checkbox"/>
d) Roof Tank	<input type="checkbox"/>
e) Well	<input type="checkbox"/>
f) River or Creek	<input type="checkbox"/>
g) Other, please specify _____	<input type="checkbox"/>

Which of the above sources of water (a - g) are used for these purposes:

Food preparation	<input type="checkbox"/>
Bathing	<input type="checkbox"/>
Laundry	<input type="checkbox"/>
Cleaning (dishes, floors)	<input type="checkbox"/>

Other, please specify _____

2 What is the quality of your drinking water?

- Good
- Average
- Poor

3 Does the household water ever dry up?

- Never
- Sometimes (once every 3 years)
- Every Year

4 Are there any problems with your water supply in the following areas:

- Low Pressure
- Water Hammer
- Leaky pipes
- Corroded pipes

Other (Please State) _____

B. Toilet Facilities

1 Does this household have a:

- Flush Toilet
- Water Seal Privy
- Pit Latrine
- None

Other, please specify _____

2 Is the toilet:

- Private and located inside the house
- Private and located outside the house
- Shared and inside the house
- Shared and located outside the house

Other, please specify _____

3 Is the toilet superstructure made from:

- Corrugated iron
- Wood
- Concrete
- Natural Materials

Other _____

4 Does your toilet structure lead to a:

- Private septic tank
- Septic tank shared between one or more households
- Public sewer system

Other, please specify _____

Box 4: Community Health Status

(This section to be answered by **each individual** in the household, 16 years and over)

1 After going to the toilet, do you usually:

- Not wash your hands
- Wash your hands with only water
- Wash your hands with soap & water

2 Why do you wash your hands after going to the toilet?

- Because you were told to
- It is hygienic to do so
- Because that's what other people do
- Don't know

Other, specify _____

3 Do you boil your drinking water

- Yes
- No
- Sometimes

4 Do you know what diarrhoea is?

- Yes
- No

If the answer to q'n 4 was yes, please describe in a few words what you think diarrhoea is

5 Have you had diarrhoea in the past 2 weeks?

- Yes
- No

Male	Female

6 (a) Have you had any of the following symptoms in the past two weeks:

- (i) Fever
- (ii) Vomiting
- (iii) Worms (in the stool)

Male	Female

(iv) Other, please describe _____

(b) How long did the symptoms last (indicate i-iv)?

- Less than 2 days
- 2 - 5 days
- 5 - 10 days
- 10 - 14 days

Male	Female

7 Do you seek treatment at your local clinic when you or a member of your household falls sick with these diseases?

- Yes
- No

If no, why?

- It is not important enough to go
- Drugs are too expensive
- Clinic is not easily accessible
- It is too time consuming

8 Surveyor inspect present excreta disposal facilities for cleanliness.

Box 5: Priority Problems

1 What do you consider as problems in the village? Number the problems outlined below according to the following key: 1 = Important 2 = Not so important, but needed 3 = Not a problem

- a) Lack of roads leading to the village
- b) Unreliable Water Supply
- c) Poor Water Quality
- d) Lack of transport to main centers e.g. health clinic, shops etc
- e) Lack of means of communication
- f) Toilets
- g) Stray animals in village
- h) Rubbish
- i) Other, specify: _____

2 For problems rated 1, state specifically why you consider them to be problems (state a - i):

- Lack of finance
- Lack of support from local authorities (District Offices)
- Poor village co-ordination for such activities
- Other, specify _____

3 For problems rated 1, state specifically how you think these problems can be overcome (state a - i):

- Better service from local authority
- Better on-going relationships between villages and local authorities
- Better organised and motivated village committees
- Easier means of obtaining financial assistance
- Easier access to villages (better roads, boat services)
- Others, specify: _____

Thank you for your time and co-operation

The Survey questionnaire was translated into Fijian and Hindi for use in the communities and was used by the Project Team together with the community members.

General Observations of the Survey Team:

- Not all questions answered properly.
- Confusion in answering individual multiple questions.
- Some questions found to be irrelevant.
- Unanswered (blanks).
- 14 Villages surveyed only 12 identified as valid.
- OMITTED: Rakiraki (Matainubu Settlement): Population 23, and (Naseroi): Population 53 as there were only two households that had members not at home in these settlements at the time of survey, as most of the people had left for some event out of town.

Data collected from the survey was entered into a SPSS Data Editor, a qualitative statistical analysis programme. This programme is designed for inputting data and analysing variables. In general the survey gave the following results:

At the Household level:

- Total of 270 households and 390 individuals interviewed.
- 66% of families live in nuclear families.
- Majority of the families have four to eight members in the family with over 21% having an average of six in the family.
- Ethnic distribution: About 85% of the survey consisted of Fijians and 15% Indians.
- Education: Majority of the population have junior secondary as the highest education level. (8%) more females have no formal education.
- Occupation: 66% depend on agricultural produce as their main source of income.
- Water Supply: About 40% of all villages receive their water supply unmetered from the main PWD water source. Alternatives were metered water supply (30%), well water (22%), roof/tank catchment (18%), river/creek (20%), communal standpipe (10%).
- Only 12% indicated their water supply quality as poor.
- 32% indicated that water dries up every year, and 40% said occasionally.
- Problems with water supply: 44% complained of low pressure, 30% reported leaky pipes.
- Type of toilet: 43% use water seal privy, 36% use pit latrines, and only 18% use flush toilet types.
- Social Amenities Score: Over 70% of population live below the 4 score.

At individual Household Member level:

- 50% wash hands with soap, 48% with just water and 2% do not wash hands.
- 30% boil drinking water, 42% sometimes and 30% do not.
- 11% do not know what diarrhoea is.
- 14% said they had diarrhoea in the last two weeks.
- Waste water disposal system: septic tank: 25% had this either private or shared.
- 75% indicated that there is no disposal system and often used a simple ground drainage system since 35% used pit latrines.
- In all 12 villages, majority of the workers are in the agricultural sector.

- The highest educated are in tertiary levels but are in very low numbers. The average level of education is junior secondary for both males and females. Nadelei showed the most number of educated people. There are more educated males in tertiary level overall.
- Three villages considered sanitation a priority, Keiyasi, Balevuto and Nadelei.

A review of the questionnaire results showed Keiyasi, Balevuto and Nadelei considering sanitation as a priority and was a determining factor in choosing these communities for the Project.

5. Water Quality

During the survey, water quality tests were also carried out using modest equipment gathered from members of the Project Team. The intention of the water quality tests was to get an understanding for the current situation with regards to water quality. Samples were collected from nearby water bodies such as rivers and also from the drinking sources such as wells, rainwater tanks, and taps.

General Results of the survey are as follows:

- pH levels were found to range from 6.7 to 8 with an average of 6.8. Standard of pH levels are 6.5 to 8.5 thus the levels found are acceptable.
- Turbidity: Standard level is 5 NTU, results show levels as high as over 250 to as low as 0 NTU.
- Temperature: Averaging 27°C
- Salinity: testing also showed low levels of minerals indicating salt content.
- Chlorine: No chlorine found in all samples taken.
- Nitrite: Standard = 1
- Nitrate: Standard = 10
- Sulphate: Standard = 250
- Faecal Coliform: Nabukelevu Village, outside of Navua showed the highest level of Faecal Coliform counts. An average of 30% coliform growth was seen in most village water supplies.

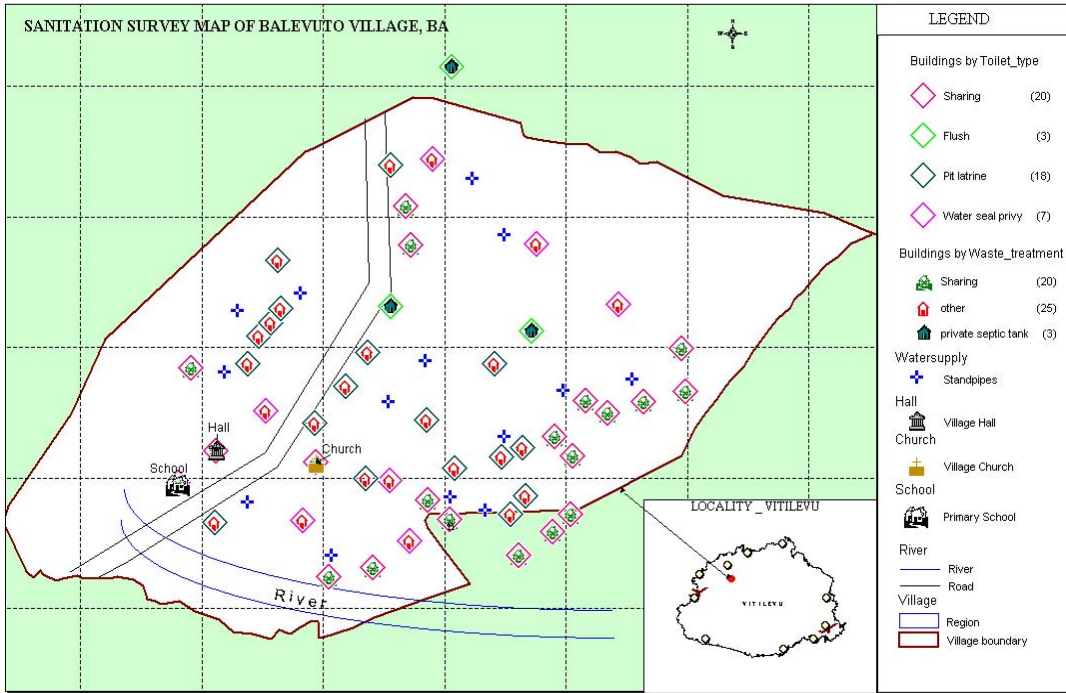
The results from the water quality survey cannot be substantiated as samples were taken in the field using equipment that was outdated and not properly calibrated therefore water quality information was not used as a basis for making decisions on which communities were chosen for Project implementation.

6. Geographical Information System

GIS information was gathered by the SOPAC Team for the majority of the communities surveyed, however there was a technical fault with the equipment which resulted in only three data sets being processed for only three communities.

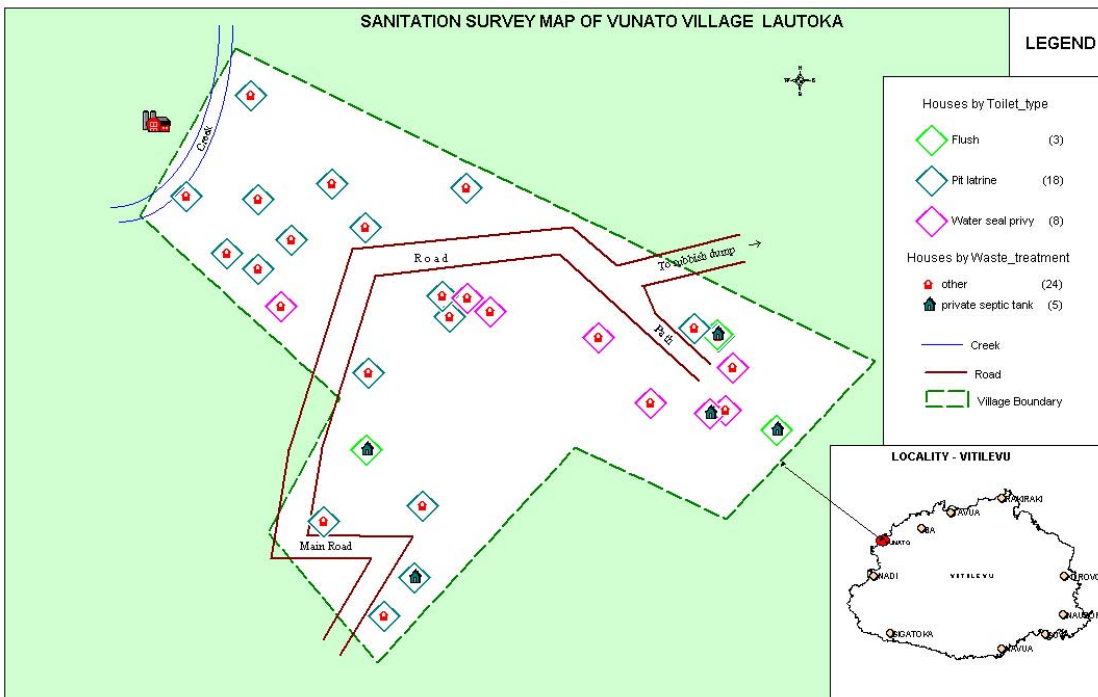
The three villages for which data was successfully captured and processed were (Vunato) Lautoka, (Balevuto) Ba, and (Nabukelevu) Navua.

Balevuto, Ba



Map indicates 48 houses, a church, a school and a village hall. There are about 14 communal standpipes spaced out around the village grounds. An average of three houses to a standpipe, thus easy access to water supply. Water is pumped from the river direct to the standpipes. There is no treatment of water. The river is also used for washing clothes, drinking water for livestock and bathing.

Vunato, Lautoka



Vunato is more of a settlement than a village, located just outside of Lautoka city; there are about 30 houses. Each house has its own piped metered water supplied from the Public Works Department. No communal standpipes have been indicated. The main road passing through the settlement leads to the City rubbish dump. Daily dump trucks drive through the village. A narrow creek littered with debris runs behind a row of houses.

Across the creek is the industrial area, which emits smoke and discharges waste into the creek. The settlement area is based on marshy grounds with poor drainage system.

**ANNEX B: HANDS-ON TRAINING WORKSHOP PARTICIPANTS LIST
MAY 2004**

Name	Organisation/Address	Contact
Mesake Biunaiwai	Keiyasi Village, Navosa	
Penioni Cagilaba	Keiyasi Health Office	
Samisoni Tukana	Balevuto Village, Ba	
Vitale Varo	Ba Health Office	Tel: 6674045
Sofaia Tatatau	Tavua Health Office	Tel: 668 0500 E-mail: sofaia@connect.com.fj
Semi Koroi	Nadelei Village, Tavua	
Niko Nadolo	FSchM student	E-mail: S019093@fsm.ac.fj
Mele Turagavou	FSchM student	E-mail: S019073@fsm.ac.fj
Pritika Edwina Raju	FSchM student	E-mail: S030793@fsm.ac.fj
Mary Ackley	US Peace Corps/Vunisinu	E-mail: ma_pcorps@yahoo.com
Pita Vatucaawaqa	Vunisinu Village	
Kelera Oli	Fiji School of Medicine	E-mail: S952551@fsm.ac.fj
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Navi Litidamu Keshwa Nand	Fiji School of Medicine Tamavua Campus Suva	
Leonie Crennan Rhonda Bower Arieta Navatoga	SOPAC Secretariat Private Mail Bag Suva	Leonie@sopac.org rhonda@sopac.org arieta@sopac.org

**ANNEX C: COMMUNITY HEALTHY ISLANDS WORKSHOPS PARTICIPANTS LISTS
JUNE 2004**

Community Workshop 1 – Keiyasi Village, Sigatoka – 16th-17th June 2004

	NAME	VILLAGE
1.	Nasoni Kuriyago	Keiyasi
2	Ravuama Kuriloa	Draiba
3	Uraia Davu	Edrau
4	Vinaya Waka	Edrau
5	Simione Gusuivalu	Keiyasi
6	Eroni Sau	Edrau
7	Viliame Veto	Sawenw
8	Batiniloka Nadule	Sawene
9	Waisea Toutou	Edrau
10	Apisaki Matawalu	Keiyasi
11	Aseri Turagadrau	Keiyasi
12	Salome Latilevu	Navula
13	Taraivini Bula	Keiyasi
14	Lotawa Naliva	Navula
15	Titilia Leiroti	Keiyasi
16	Miriama Kadavu	Nalovosa
17	Anaseini Bolakoro	Navula
18	Manaini Ravela	Nalovosa
19	Alivani Leano	Nalovosa
20	Litiana Lalilevu	Nalovosa
21	Titilia Vatiseva	Nalovosa
22	Lereani Novo	Navula
23	Simione Loli	Keiyasi
24	Makitalena Voli	Natao
25	Litia Navukula	Keiyasi
26	Titilia Ratudradra	Keiyasi
27	Salaseini Roko	Draiba
28	Jonasa Tui	Keiyasi
29	Vara Nadule	Keiyasi
30	Seruwaia Baivatu	Keiyasi
31	Aseai Vialani	Keiyasi
32	Miriama Kurinacoba	Nalovosa
33	Mereoni Limaiwale	Keiyasi
34	Seva Matawalu	Keiyasi
35	Ratu Viliame Naliva	Keiyasi
36	Talatala Cagi	Keiyasi
37	Sainiana Matanisiga	Keiyasi
38	Vilisi Naseka	Keiyasi
39	Keleni Devo	Keiyasi
40	Alini Cagi	Keiyasi
41	Sainiana Naivalucava	Keiyasi
42	Ratu Meli Nakasavu	Keiyasi
43	Saimoni Tiqara	Keiyasi
44	Mesake Biunaiwai	Keiyasi
	Ministry of Health, Sigatoka 1. Penioni Cagilaba 2. Luisa Matararaba	

Community Workshop 2 : Balevuto Village, Ba, 21st-22nd June 2004

	NAME	VILLAGE
1.	Neumi Tabuyaqona	Balevuto
2.	Petero Kubu	Balevuto
3.	Marika Naura	Balevuto
4.	Jotame Vesi	Balevuto
5.	Vosaboto	Nadrugu
6.	Peni Naulu	Toge
7.	Paula Tora	Toge
8.	Iosefo Matakobulu	Nadrugu
9.	Semi Kunatani	Balevuto
10.	Kaliova Rasaku	Balevuto
11.	Avisake Tora	Balevuto
12.	Veniana Nadibi	Nadrugu
13.	N Botitu	Balevuto
14.	Isireli Nounou	Balevuto
15.	Anasa Valu	Nadrugu
16.	Siteri Masiquna	Balevuto
17.	Luke Nabaro	Balevuto
18.	Siteri Senitirau	Balevuto
19.	Rota Vakaloloma	Balevuto
20.	Navolioni Tureau	Balevuto
21.	Eparama Koro	Balevuto
22.	Inoke Qoro	Balevuto
23.	Viliame Nawau	Balevuto
24.	Joseva Gakobau	Balevuto
25.	Tevita Lewanacu	Balevuto
26.	Atama Rokobati	Balevuto
27.	Suliano Bogileka	Balevuto
28.	Joseva Rasaku	Nadrugu
29.	Watisoni Malua	Balevuto
30.	Etuwate Tabua	Balevuto
31.	Lanieta Tora	Balevuto
32.	Jone Kale	Balevuto
33.	Inoke Rauga	Balevuto
34.	Samisoni Tukana	Balevuto
35.	Ratu Sela Lewasau	Balevuto
36.	Mareta Vunisa	Balevuto
37.	Eroni Maqala	Balevuto
38.	Watisoni Malua	Balevuto
39.	Luke Nabaro II	Balevuto
40.	Misikini Manasa	Balevuto
41.	Vilitati Kina	Balevuto
42.	Sitivenusi Bari	Balevuto
43.	Joseva Ratuba	Balevuto
44.	Rupeni Vutoni	Balevuto
45.	Sitiveni Nasigata	Balevuto
46.	Iosevo Masiquna	Balevuto
47.	Ropate Naigada	Balevuto
48.	Rev. Vijay Chandra	Chairman of BRLA
	Ministry of Health, BA 1. Vitale Varo 2. Isireli Vuanivono 3. Ifereimi Kubukawa 4. Rosita Mala 5. Ashneet Bhagat 6. Ivona Tavuki 7. Mereseni Narikalea	

Community Workshop 3: Nadelei Village, Tavua, 30th June – 1st July 2004

	NAME	VILLAGE
1	Semi Koro	Nadelei
2	Susana Naica	Waikubukubu
3	Naiyaba Waqawai	Waikubukubu
4	Ilai Manoa	Nadelei
5	Karolina Nai	Nadelei
6	Nanise Ranadi	Nadelei
7	Akanisi Tabua	Nadelei
8	Vinaiisi Voreqe	Nadelei
9	Sera Cawai	Nadelei
10	Veniana Vauvau	Nadelei
11	Suluweti Nai	Waikubukubu
12	Elena Fulori	Waikubukubu
13	Miliakere Nailolo	Nadelei
14	Aliti Laite	Nadelei
15	Masilina Ranadi	Nadelei
16	Asinate Kavetani	Nadelei
17	Alefina Loli	Nadelei
18	Petero Loli	Nadelei
19	Sailosi Vunikuta	Waikubukubu
20	Kaliova V	Nadelei
21	Meli Ratu	Waikubukubu
22	Anaseini Navuni	Waikubukubu
23	Miliakere Naisola	Waikubukubu
24	Sisilia Nagone	Nadelei
25	Epeneri Moceidreke	Nadelei
26	Merewalesi Natabu	Nadelei
27	Naica Toutou	Nadelei
28	Merelisoni Savewa	Nadelei
29	Arieta Nadumu	Nadelei
30	Degei Naduruka	Waikubukubu
31	Jovesa Natoria	Nadelei
32	Luke Vauvau	Waikubukubu
33	Emosi Ratuwage	Waikubukubu
34	Epeli Takolevu	Nadelei
35	Paula Nagone 3	Nadelei
36	Tomasi Ratukavida	Nadelei
37	Jone Saitabu	Nadelei
38	Sereima Dela	Nadelei
39	Mere Lauwai	Nadelei
40	Siteri Naisu	Nadelei
41	Udite Nadumu	Nadelei
42	Lavenia Nasalasala	Nadelei
	Ministry of Health, Tavua 1. Sr. M Q Nayasi 2. Staff Aliti Kanata 3. Ifereimi 4. Tarai Nakoli	

ANNEX D: KEIYASI ACTION PLAN

	PROBLEM	POLICY (LAW)	STRATEGY	TIME-FRAME	PERSON RESPONSIBLE	RESULTS (INDICATORS)
1. HEALTH PUBLIC POLICY	Stop animals from entering the village	Animal policy	Fundraising	July – 2004 Three-month plan – October 2004	Village Health Committee Village Headman	Clean village & surrounding Fewer people getting ill Healthy/rich vegetation
	All households with own utilities	Each house to have own toilet	Fundraising Request for government assistance	December 2004 Three-yrs plan December 2006	District Officer Village Health Committee Village Headman	–Hygiene level increase –Visitors are happy & satisfied while staying in the village
2. PHYSICAL ENVIRONMENT	Electricity in the village	All households to have access to electricity power	–Collect fund –Request for government assistance through District Officer	Two-year plan November 2004 November 2006	Village committee Clans headman Village headman & District Officer	–Light in the village –Children able to study at night
	To have 24 hours supply of water in the village	Each household to have own source of water	Fundraising Government assistance	October 2004 – August 2004	Village Headman Village committee	No problems in having flush toilet People won't be fetching water from nearby river for home use
3. SOCIAL ENVIRONMENT	Increase children's education level	Support children's education	Provide support & assistance in school	Long term	Parents Committee School Manager	Successful Decreased unemployment rate for youth

4. ACCESS TO GOVT. & NON-GOVT. SERVICES	Meet all health problems especially to needy	To help widows, elders, sick	Visit & help regularly –Social welfare	As soon as possible	Women's Club Men's Club	Happy & healthy community
5. KNOWLEDGE & SKILLS	Increase level of education and knowledge	Allow education officials to visit village regularly	Request for assistance from: –Ministry of Education –Ministry of Health –Police Force	Long term	Health Committee Education Committee Social Committee	Improvement in village standard of living
6. COMMUNITY RELATIONS	Peace & harmony in the village or any community	Enforce socialization	Sharing knowledge and helping one another	Immediately	All Clan headman Village headman Church elders	

ANNEX E: BALEVUTO ACTION PLAN

1. HEALTH PUBLIC POLICY	PROBLEM	POLICY (LAW)	STRATEGY	TIME-FRAME	PERSON RESPONSIBLE	RESULTS (INDICATORS)
	Existing committee not productive	Draw out work plan for each month and year	– Have regular meetings Documentation & action	– Once a week – Once a month	Village Health Committee Health Department Village headman Clan headman Chief Villagers (all community members)	Projects Funds collected
2. PHYSICAL ENVIRONMENT	1. Water problem	– Install bigger water tank or – Build reservoir	Work together Help each other Fund raise	Every three months	Village headman Village committee Health committee All villagers Health Department Regional Office	Install water tank All houses with running tap water
	2. Toilet 3. Rubbish disposal 4. Stray animals					
3. SOCIAL ENVIRONMENT	Unwanted pregnancy	Ministry of Health to conduct courses at the village	Obey village rules & laws	Every three months	Health Dept Health committee	No Drug abuse
	Drug Abuse Excessive yaqona consumption	Increase people's knowledge on health issues	Strengthen traditional customs/norms	Visit once a week	Village headman Villagers	
4. ACCESS TO GOVT & NON-GOVERNMENT SERVICES	1. No dispensary	Build village dispensary	Fundraising Seek advice from Ministry of Health	Three months	Health committee Village nurse Village headman Village committee	Village nurse present Drugs needed
	2. Health problems (diseases)	Conduct health awareness training				
5. KNOWLEDGE & SKILLS	1. School dropouts 2. Unemployment	Community work Support from parents	Workshops Seminars Health Visit	Once a month	Health Dept Village Headman Villagers	Community Awareness on Health Problems
6. COMMUNITY RELATIONS	Weak spiritual upbringing	Prayer Meeting	Visit by church elders	Daily Weekly	Reverend Preachers Parents Village headman Villagers	

ANNEX F: NADELEI ACTION PLAN

	PROBLEM	POLICY (LAW)	STRATEGY	TIME-FRAME	PERSON RESPONSIBLE	RESULTS (INDICATORS)
1. HEALTH PUBLIC POLICY	<p>1. Stray animals</p> <p>–Littering in river/streams</p> <p>–no proper rubbish dump</p> <p>–Poor drainage</p> <p>–Poor toilet condition</p> <p>No visit from Health Officials</p>	<p>Fence village</p> <p>Properly dispose rubbish</p> <p>–Village to have proper drain</p> <p>–Each family to have own toilet facility</p> <p>Have monthly visit</p>	<p>Look after own animals</p> <p>Burn, bury or decompose appropriate rubbish</p> <p>– Construct cement drain</p> <p>All families to build toilets</p> <p>Village elders to make frequent contacts with health people</p>	<p>Village headman' s day</p> <p>Daily task</p> <p>–To begin in August</p>	<p>All</p> <p>Head of households</p> <p>–Health department</p> <p>–Village nurse</p> <p>–Village health committee</p>	<p>– Lesser no. of sick people</p> <p>– Healthy clean surrounding</p> <p>– Happy family</p> <p>–No mosquito/ diseases</p> <p>–One toilet to each family</p> <p>Frequent visits from health officials</p>
2. PHYSICAL ENVIRONMENT	<p>Kitchen Tap</p> <p>No Village fence</p> <p>No proper pig sty</p>	<p>Each family should have one</p> <p>Repair</p> <p>To make</p> <p>Do not allow pig sty inside village fence</p>	<p>Timber, roofing iron etc</p> <p>Barbed wire</p>	<p>As soon as possible</p> <p>Every Tuesday</p> <p>Village meeting every month</p>	<p>Family members</p> <p>Villagers</p>	<p>Clean household</p> <p>Clean village</p> <p>Clean river/streams</p>
3. SOCIAL ENVIRONMENT	<p>No respect for one another</p> <p>No reconciliation</p> <p>No acceptance by villagers</p> <p>Disunity in the village</p> <p>No government assistance</p> <p>Excessive yaqona consumption</p> <p>Increased adultery</p>	<p>Communal work & gathering</p> <p>Prayer meeting</p> <p>Meeting to be held regularly (once a week)</p> <p>Yaqona to be drunk only on special occasions/appropriate time</p>	<p>To possess building material & equipment</p> <p>Contribute or take part in community work</p> <p>Get advice from department of health & agriculture</p>	<p>As soon as possible</p>	<p>Planned by clan/tribe.</p> <p>All Committee members</p> <p>Everyone</p>	<p>Peaceful, happy, healthy village</p>

4. ACCESS TO GOVT. & NON-GOVERNMENT SERVICES	<p>No support to the women's club</p> <p>No visit by govt officials like health, police and as a result problems like drug use, unwanted pregnancy, increase school dropouts</p>	<p>Invite President of Fiji Women's Group</p> <p>Request for government assistance from officials concern</p> <p>Hold regular prayer meeting</p>	<p>Write a letter to request for:</p> <p>– Training by govt official on handicrafts/sewing etc</p> <p>–Visit by govt officials</p> <p>Organise awareness day</p>	<p>Last week of every month</p> <p>Visit at least once a year</p>	<p>All</p> <p>All & Government departments concern</p>	<p>Increase knowledge & skills</p> <p>Vibrant, intelligent skilled youth</p>
5. KNOWLEDGE & SKILLS	<p>No support for children in school</p> <p>No preschool or kindergarten</p>	<p>All children to attend school</p> <p>Construct village kindergarten</p>	<p>Education awareness meetings with children</p> <p>Fund raise</p>	<p>As soon as possible</p>	<p>Parents & children</p> <p>Village committee</p>	<p>Educated children</p> <p>Decrease unemployment</p> <p>No school dropouts</p>
6. COMMUNITY RELATIONS	<p>No unity</p>	<p>All to be responsible in looking after welfare of the village</p>	<p>Elders to be leading by example</p>	<p>Have regular meetings & discussion about problems & how to address them</p>	<p>All</p>	<p>Successful community</p>

ANNEX G: MOU PROJECT PARTNERS

MEMORANDUM OF UNDERSTANDING

BETWEEN

WORLD HEALTH ORGANISATION, MINISTRY OF HEALTH FIJI,
FIJI SCHOOL OF MEDICINE AND
THE SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION
(SOPAC)

FOR

THE SANITATION PARK PROJECT

SUVA – 05 DECEMBER 2001

FIJI ISLANDS

The Ministry of Health Fiji, hereinafter referred to as 'MoH', Fiji School of Medicine, hereinafter referred to as 'FSM' and the South Pacific Applied Geoscience Commission, hereinafter referred to as 'SOPAC',

Recognizing rural sanitation and wastewater management are closely linked with the sustainable development of and poverty alleviation in the South Pacific islands, and

Further recognizing that it is essential to improve knowledge, attitudes and the actions of governments and communities relating to achieve sustainable sanitation and wastewater management,

Noting that MoH is the national agency in Fiji responsible for the design, implementation and monitoring of rural water supply, and sanitation projects and programmes,

Further noting that FSM is the regional organization responsible for the training of Environmental Health Officers for the Health Ministries of the South Pacific governments,

Further noting that SOPAC is recognized by its Member States as the regional organization with responsibility for activities related to water resources, sanitation and hygiene, and also

Further noting that the WHO is the global UN agency responsible for environmental and human health, and poverty alleviation through improved water supplies, sanitation and hygiene,

Acknowledging the need to improve the effectiveness of implementing rural sanitation programmes in the South Pacific, is a pre-requisite to improving public health and poverty alleviation, therefore

HAVE AGREED AS FOLLOWS:

ARTICLE I

Co-operation and consultation

1. The parties agree to co-operate on all matters concerning the implementation and monitoring of the proposed Sanitation Park Project, including on-site sanitation technologies, sanitation & hygiene education, training and public awareness, capacity-building, sharing of data and information.
2. The parties agree to co-operate on opportunities and activities throughout the region that result from and follow on from the proposed Sanitation Park project. These may include but are not limited to: technical support and advice, training, public awareness raising and wise practice guideline dissemination on rural sanitation facilities and their sustainable use and management by rural and remote island communities.

ARTICLE II

Roles, Responsibilities and Representation

1. In agreeing to collaborate on the Sanitation Park Project, the following roles and responsibilities are agreed upon for this project:

The **MoH**, Fiji, shall act as the lead organization (the implementing agency) and will be responsible for project administration and finances. Members of staff, with appropriate training and community liaison background will be made available to the project to facilitate community access, participation and mobilization.

The **FSM** will be the primary agency involved in community empowerment, survey work and training of local government staff. FSM shall provide sufficient land to the project to enable the construction of the Sanitation Park. The FSM shall provide appropriately qualified staff and students to carry out community assessments and discussions and provide technical advice. FSM will include the Sanitation Park within its teaching curriculum for

Environmental Health officers, and make the facilities available to existing professional sector staff.

SOPAC will be the primary agency responsible for project management (the executing agency), inter-agency liaison, technology advice, data storage, project reporting and guidelines dissemination. SOPAC will make available GIS/GPS equipment, office and library facilities, publication expertise and media dissemination through web sites and regional networks.

2. Representatives from each agency agree to participate at all planning and review meetings on matters pertaining to the implementation of the Sanitation Park Project.

ARTICLE III

Exchange of information and documents

1. The parties agree to the exchange of publications between the three agencies including reports and relevant work plans relevant to the Sanitation Park project or that may impact upon it in terms of staffing, financial or other material resources.
2. Each party shall keep the others informed of developments in the work and activities of mutual interest to rural sanitation and community participation and empowerment approaches.

ARTICLE IV

Implementation

1. The authorized signatories from the three parties may make specific arrangements for the satisfactory implementation of this Memorandum of Understanding.

2. This Memorandum of Understanding shall not impinge on or interfere with the sovereign rights of any individual member of any organization.

ARTICLE V

Amendments

The provisions of this Memorandum of Understanding may be amended by mutual agreement of all three parties. The amendments shall enter into force after the approval of their appropriate bodies.

ARTICLE VI

Termination of the Memorandum of Understanding

Any party may terminate this Memorandum of Understanding subject to six months' written notice. If one of the parties decides to terminate this Memorandum of Understanding the obligations previously entered into in respect of projects under implementation through this Memorandum of Understanding shall be decided upon by the parties on a case-by-case basis.

ARTICLE VII

Entry into force


After this Memorandum of Understanding has received the approval of the appropriate bodies of the three parties, it shall enter into force immediately upon signature by the authorized representatives identified below:

Done at WHO Headquarters in Suva 05 December 2001, in three copies in the English language.



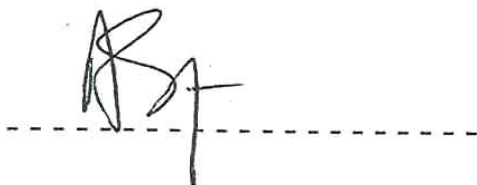
Manasa Niubalerua, Chief Public Health Inspector, Ministry of Health of Fiji



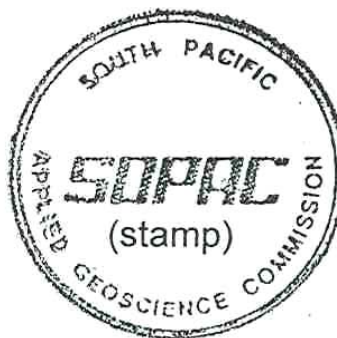


Wame BARAVILALA, Dean
Navi Litidamu, Senior Lecturer, Fiji School of Medicine





Alfred Simpson, Director, SOPAC



ANNEX H: LIST OF ACRONYMS AND ABBREVIATIONS

CT	Composting Toilet
FSchM	Fiji School of Medicine
HI	Healthy Island
HPC	Health Promoting Communities
HQ	Head Quarters
MoH	Ministry of Health, Fiji
NZAID	New Zealand Agency for International Development
SOPAC	South Pacific Applied Geoscience Commission
VIP	Ventilated Improved Pit
WHO	World Health Organisation