GEF Pacific IWRM Demonstration Project

Improvement and Sustainable Management of Neiafu's Groundwater Resources

Tonga

Final Report

Vava'u Tonga,

June 2014

An Initiative of the Global Environment Facility Supported Project:
"Implementing Sustainable Water Resources and Wastewater Management in Pacific Island Countries"
GEF Pacific IWRM Project

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PREFACE

The source of freshwater for Tonga is either through rainwater harvesting, or extracted from a thin freshwater lens within the highly porous limestone substrate. The water resources of Tonga are primarily in the form of groundwater. Surface water resources are not present on most islands; exceptions are 'Eua where supply originates from springs in caves high above sea level, and on a number of the volcanic islands including Niuafo'ou and Niuatoputapu and Tofua, where there are several salty lakes.

Water is extremely valuable and an essential source of life. Humans, animals and plants critically depend on sufficient and sustainable supply of water not only for their very existence but also for social, economic, environmental needs and development. This vital resource is limited in the island Kingdom of Tonga. The unavoidable growth of population, climate change and related disasters have directly impacted this highly valuable and scarce resource.

The survey that was done by the GEF IWRM-Tonga Project in 2010 at the capital of Vava'u (Neiafu Town) stated that majority of the community based their daily water usages on ground water resource where approximately 85% of the Neiafu people are rely on groundwater and 15% rely on rainwater.

Currently, there are no central/public sewerage systems in Tonga. Most of the population is served by on-site facilities. According to the 2006 Census, 70% households have flush toilets, 11% have manual flush toilets, 18% have pit latrines, and 0.3% of households reported having no sanitation facilities. Poor sitting, design and maintenance of on-site facilities is commonplace, causing local contamination of groundwater in addition to contamination of lagoon and marine environments (Newton, 2008). The Household Drinking Water Safety Planning Manual developed and piloted by the GEF-IWRM Project in Vava'u has been a successful first step in addressing this issue at the community level. A more widespread roll out, and better design standards are also needed.

Proper management of water resources and ensuring the sustainable supply of sufficient and good quality of water in Tonga are crucial. Due to the utmost significance of this natural resource and its scarcity in terms of its availability therefore requires special and serious consideration for its management and control particularly in view of implications of water security for both present and future generations in Tonga.

The protection of water resources in Tonga is the responsibility of all Tongans, as individuals and collectively through government agencies, non-government organisations, civil societal groups as well as communities. Present and future generations of Tongans have sustainable access to sufficient, safe and good quality water and are better prepared to effectively respond and adapt to climate change impacts and disaster risks.

The Tonga National IWRM Plan is a draft only, and has not yet been reviewed or endorsed by the National Water Resources Committee. Further content and consultative work needs to occur before this can happen, followed by submission for Cabinet approval. At the highest level, the current primary Acts in Tonga provide for the effective management of water and coastal management issues. The single exception to this is the Government's failure to enact the Water Resources Bill 2012. This is critical to the effective and sustainable management of the Kingdom's freshwater resources and a significant impediment to establishing and consolidating the IWRM functions in Tonga.

Lord Ma'afu

Minister for Lands, Survey, Natural Resources, Environment and Climate Change

'Asipeli Palaki

Chairperson of Neiafu Steering Committee

1. Water and Sanitation Issues in the Development of the Tonga GEF Pacific IWRM National Demonstration Project

Water resources in Tonga include both surface and groundwater. Most of the surface water is rainwater collected and stored in the water tanks, although there is also limited fresh surface water in streams, and lakes on Eua, and few salty lakes on the islands of Tofua and Niuafo'ous. Groundwater is contained in underground aquifers within freshwater lenses, usually in porous limestone (for example, Tongatapu) or unconfined sandy aquifers (for example, Lifuka, Ha'apai).

Groundwater is used domestically for daily operations such as cooking, bathing, washing food, watering plants and animals, flushing toilet, cleaning the house and vehicles. It can also boiled and used for drinking if rainwater is not available. It is distriputed to homes, government buildings, shops, industries and tourist accommodation by the Tonga Water Board (TWB) in the urban centres of Nukualofa in Tongatapu, Neiafu in Vava'u and Pangai-Hihifo in Ha'apai and to villages in 'Eua. Many villages outside these centres have their own reticulated water system administered by water committees.There's a water meter being installed infront of every househods at the area under TWB jurisdiction. Some villages are now introducing individual meters.

Water extractedfrom village water supply systems is not recorded. It is not known exactly how many bores are operating on Tongatapu, or in the other island Groups and it is not known what volume is being extracted. Bores can requested for private home, schools, churches, or village water supply.

There is no centralised reticulated sewerage system in Tonga. All wastewater is managed by on-site systems, with supervision by the Ministry of Health (MOH) when resources permit. In this respect wastewater management is in the hands of the community. Poorly constructed or inappropriate sanitation systems are common, resulting in the potential for pathogens and nutrients being introduced into the surrounding environment, including ingress to groundwater. Excess nutrient loads appear to be impacting the environment health of the near shore reef in the Nuku'alofa area, and the lagoon in general. Algal growth can be seen in both areas. In addition, there are concerns that fish harvested in these areas, particularly shellfish, may be contaminated. Waterborne disease is common. A concern with the current sanitation practice is the potential for contamination of the aquifers designated for TWB and village reticulated supply. This can be exacerbated by over-pumping.

There is also a threat of contamination to private hand operated wells especially in the outer islands. Efforts by MOH to close these private wells because of this threat is very much resisted as the wells are a traditional and valued source of free, fresh water.

Dry sanitation options such as composting toilets (CTs) have been introduced in Tonga over the last decade. Introducing new toilet technology is a challenge in any culture and requires long term comprehensive attention to complex socio-cultural factors. It is now being practicing in Vava'u Island. Over the years, there have been recommendations for a reticulated sewerage system in Nuku'alofa and other urban areas throughout Tonga. However, the cost and complexity of this currently prohibitive may cause as many health and environmental threats.

There is no comprehensive law in Tonga dealing with issues of ownership, management and protection of water resources. This is despite the fact that the need for such legislation has been clearly highlighted in various documents, national consultations and conferences since 1991. Provision is made in relation to pollution of water in a number of laws and these laws involve a range of government agencies. In the absence of appropriate institutional arrangements, there are many issues of concern such as no control over extraction rates, minimal supervision of pollution of groundwater from pesticides, fertilisers and inappropriate sanitation systems, no urban control mechanisms based upon the availability of water supplies and possible adverse effects on the groundwater.

A Water Resource Bill and National Water Policy is before Cabinet and its implementation will address these and other concerns. The Water

Resource Act will give a wide range of powers to the Minister of Lands, Survey and Natural Resources to manage, protect and conserve the water resource. To support implementation of the Water Resource Act when it is passes the following capacity building will be required: Linkages to land use, agriculture, watershed and coastal management, public health; stakeholder engagement; Other programmes, projects and activities related to IWRM; Capacity development needs for removing barriers and Introducing an integrated approach toward barrier removal.

The diagnostic report stated that the identification of the hot-spot areas were involved a one day consultative workshop and the major concerns from each sector was groundwater contamination and quantity of existing supplies was the greatest priority nationally. To identify the hot-spot/sensitive areas, is just one part of a logical process working towards a full demonstration project design. A one day consultative workshop was conducted with members of the Water management Steering Committee, where majority of the members are with technical and theoretical background.

In determining the hot-spot and sensitive areas, the committee came to a consenses to apply the evaluation exercise on the major group of islands in Tonga (Tongatapu, Vava'u, Ha'apai, and 'Eua) so it may be nationally represented. The conclusion of the workshop (April 2007), the national stakeholders agreed on 3 critical and 3 sensitive areas in Tonga. The Hot Spot areas selected were (1) Neiafu Aquifer (2) Tongatapu Aquifer (3) Pangai Aquifer; the Sensitive Areas were identified as (1) Makave district aquifer (2) Hihifo District Aquifer and (3) Foa District Aquifer. The National stakeholders reached a consensus after in-depth analysis on the Neiafu Aquifer as the Demonstration Project. As there are many project in Vava'u and to be replicated in other islands of this region.

The project was chosen with the Overall Objective of "Sustainable water resource assessment and protection of the fragile Neiafu Groundwater Resources". It needs to (1) Mitigate threats from contaminants, (2) On-the-ground protection, (3) Development of a Water Resource Management Plan. The scope of this project is to address the above 3 components by:

- Review and develop options for implementation for agricultural practices and land-use as they pertain to well-field and aquifer integrity
- Develop and implement alternative options to minimise impacts of sewage and liquid waste practices (onsite demonstrations)
- Review health statistics that may be associated with water contamination and address them in all stages of the project.
- Consult and address community concerns
- Monitoring and compliance based on Water Resource Management Bill
- A Hydro-Geological survey of the aquifer and well field area
- Survey of water wastage and leaks in the groundwater extraction and distribution process
- Strengthen evaluation and monitoring of water resources
- Development of an awareness and training programme for implementation
- Establish a Committee to oversee the management of the Neiafu aquifer and a Technical Working Group for technical assistance
- Capacity Building for institutional strengthening (communities, health services, farmers affected, Neiafu Groundwater Management committee, etc.)
- Develop scenarios for the future of the Aquifer
- Management Strategies
- Financial Sustainability mechanisms

2. Management of the GEF Pacific IWRM National Demonstration Project in the Tonga

TO be completed

Lead Agency

Ministry of Lands, Survey, Natural Resources and Environment

Memorandum of Agreement Signed: 25th May 2009

On behalf of Ministry of Lands, Survey, Natural Resources and Environment

Asipeli Palaki, Acting Secretary, MLNSR

On behalf of SOPAC

Basker Rao, Deputy Director

National IWRM Focal Point

Taaniela Kula

Secretary MLSNR

National IWRM Project Manager

Mr Sisi Vaioleti Tonga'onevai

MLSNR

3. Establishment of a Coordinating Body for the Operation of the GEF Pacific IWRM Demonstration Project in the Tonga

Before the National demonstration began, there was no National coordination Body for water and sanitation project. Tonga Water Board was the only body who is specifically extracting water from underground and distributes water for the consumers at the urban areas. Sanitation was managed by the Ministry of Health (MOH) and coordinating with the Ministry of Works (MOW) and part of it from Ministry of Environment (MECC) in building code of septic tanks and all.

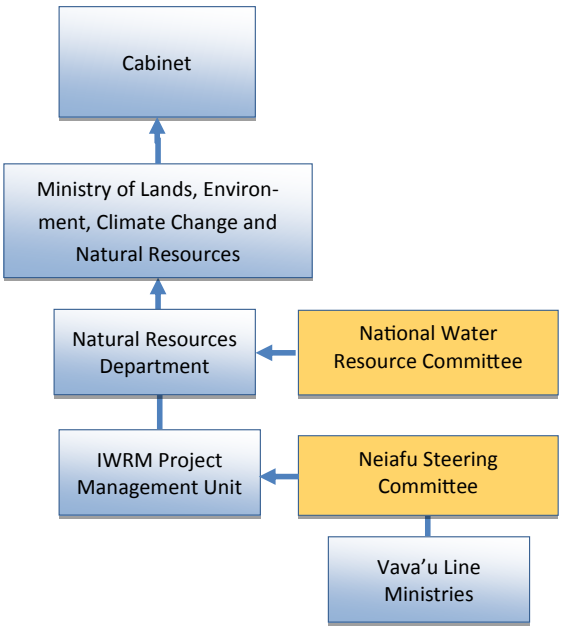
The National Committee contribute to:

- Highlighting water as a national priority
- Improved transparency and effective coordination within the sector
- Formulating government objectives and policies for the sector
- Improving access to water resources and improving integrated water resource management

IWRM basis allows communities and stakeholders to have input towards water management and to have significant impact on policies, strategies and legislation and influence direction of national water management. . By using the National Water Resource Committee, work is still the same, as the Water Management Bill is not yet endorsed by the Cabinet. However, the awareness of the issues and the needs for the National Water Resources Committee is reaching to every responsible party, but it seems the work is not moving forward. It is also due to where the demonstration site is locating while all the members of the Committee is at the largest island. It is also pointing to a non active focal point.

The Lead Agency (Ministry of Lands, Survey and Natural Resources) suggested to the Cabinet table the related stakeholders who can highlight water as a priority. The Cabinet approved the members and created the National Water Resource Committee.

The diagram below describes the national governance arrangements for the water sector.



4. Planning Stakeholder Participation in the Execution of the Tonga GEF Pacific IWRM Demonstration Project

Information was gathered initially from reports, and updates for current conditions was collected from email and telephone correspondence and a week's field trip, which included discussions with personnel from relevant ministries, non-government organisations, and community members, and personal observations. Each interview conducted, the IWRM Project was explained and the relevance and opportunity for personnel to participate in ongoing activities was discussed. This included being a member of the National Water Resource Committee.

The following table highlights the key stakeholders who were identified and categorized according to their levels of engagement in the project.

Based on the engagement analysis report the primary stakeholders were involved in the project from the beginning. For project planning most inputs were expected to orginate from them and the PMU worked closely with them through to completion. Where required under each project component the primary stakeholders were expected to identify

Stakeholders	Roles
Ministry of Lands, Survey, Natural Resources Ministry of Environment	Managing or participating in any project, or part of a project, aimed at implementing any aspect of environmental concerns Disseminating information to local stakeholders and creating public awareness on environmental concerns Responsible for land management and all matter relating to land, natural resources and environment
Ministry of Health	Responsible for rural water supply and sanitation Responsible for monitoring water quality of reticulated systems Responsible for surveillance and early warning for vector-borne and water-borne diseases
Meteorological Services	Operation and Maintenance of the climatic stations in all the island groups, and collects data on rainfall, droughts, temperature, and cyclones
Tonga Water Board	Planning, installation, operation and maintenance of public water supply systems in selected urban area of Tongatapu, Eua, Vava'u and Ha'apai
Tonga Trust (NGO)	Facilitates social, human, community and environmental development and training-eco-forestry, pesticide awareness, environmental education, community theatre, and sanitation
Ministry of Works	Owns and operates the only drilling rig used for installation of bore holes Hosting Solid Waste Management Policy National Disaster Management Office
Ministry of Agriculture, Forestry and Fisheries	Promoting agricultural and forestry production and supervising fisheries
Central Planning Department	Overall coordination and monitoring of aid projects, and for coordination of development plans including those affecting the water sector
NGOs (Vava'u Environmental Protection Association)	Facilitates social, human, community and environmental development
Neiafu Women Development Groups	Act on behalf of Women of Neiafu to promote water protection and security in their society.
Neiafu District Officer	Encourage local citizen on Neiafu to participate in Water management. District Officer holds the whole district in whatever that is needed to be done.
Neiafu, Falaleu, Fungamisi, Makave, Toula Town Officers	Responsible for keeping inform of their community's activities.

key areas with the PMU to deliver the right outcomes. At stages of the project, sub-committees of the Steering Committee were established; for example the Kovi & Kongulai Catchment Community that works closely with the PMU.

Equally important are the secondary stakeholders. Their responsibility to advise and recommend improvement towards project outcomes contributed to the overall planning and monitoring process. On-going consultations and coordination from members of this group contributed to the whole of project delivery. Additionally, they were assigned activities to promote IWRM for the demonstration site when it became appropriate and advantageous.

Involvement of senior staff in the Steering Committee brought with it the advantage of promoting IWRM at the higher political level. While being part of the IWRM project, it was evident other committee memberships are applying the lessons learnt here to other sectors and promoting IWRM mainstreaming is becoming a platform to further incorporate IWRM under this stakeholder action plan.

During project implementation many benefits from our engagement strategies were seen. Community level engagements between the PMU and its members were made through their representatives in the Project Steering Committee (HDPCC). Consultations and workshops, inputs to project workplans and engaging community members for field work and casual manpower requirements were channelled through two members from the Kovi/Kongulai committee. They were also influential chiefs of the community participating in the committees and their involvement helped to encourage more community interest in the project.

Secondly, the engagement between the PMU and the government organisations including Statutory Authority, civil society and the public was made possible through the Steering Committee. Since the Steering Committee and the APEX Body is endorsed by Cabinet decision, it has the responsibility to inform management on decisions about the project's activities and requests to progress its work. Membership compositions in these committees were at times found to be the same in other national projects and programs hence communication and collaboration results in synergies to project activities and decision making at the higher levels.

4.1 Gender Mainstreaming

Conscious of the gender bias prevalent in most Pacific countries and aware of the need to address inequality, the project attempted to develop ways to increase women's participation. Now at the end of the project with many lessons learned we see there is much work still to be done for gender mainstreaming. Throughout the project however we attempted to engage women through community level consultations and workshops. Consultations included engaging women separately in discussions on how the project's activities will benefit them as users and stewards or custodians of the outputs of the project components. The participation of women in consultations and workshops comprised of about 50% during combined gatherings with men. Facilitated by the Women Development Division and Honiara City Council, women from selected church and NGOs in Honiara took part in workshops on water demand management and water use efficiency at household level. This is a technique we will use more in the future. The difficulty with engaging women in the project planning and implementation is cultural as out of respect and tradition, women do not speak openly during community meetings. We have learned now to find ways to engage women separately, in an open and comfortable environment for them.

In the Project Steering Committee the representation of women was only 10% of the total members. It was clear that their inputs to project management at the coordination level were minimal even if they were present for meetings. However, at the sub-committee level women's involvement increased to about 30%. They were engaged in the water safety plan's field assessments planning, field works compilations and evaluations during the course of the assessments. The absence of a higher number of women in the Project Steering Committee or APEX groups shows the few number of women who hold high posts in the government and are thus eligible to join, this may be associated with lower levels of education of women in the community.

5. Results Oriented Planning and Implementation of the GEF Pacific IWRM Demonstration Project in Tonga

5.1 Logframe Development

The Neiafu Steering Committee was formed in 2009 and first meetings were held in July of that year. During that meeting the Project was introduced to the Ministry and private sector members involved in the committee. They modified the original Logframe to better reflect the needs and priorities of the communities and endorsed the project activities. Quarterly meetings are held where the Project Management Unit addresses the committee and reports on activity progress, and raises any issues of concer. During these meetings activities are agreed to and added or removed as the committee deems necessary.

5.2 Priority Areas of Work and Results

The following table summarises the priority objectives and activities of the IWRM project. The full project logframe is included with this report as Annex 4.

Project Objectives	Activity
Goal:	
Outcome 1: Mitigate Threats from Contaminants	
Output 1.1 Improved agricultural practice and land use that protect the aquifer and human health	Activity 1.1.1 Undertake a Study to assess the extent of groundwater pollution from agricultural practices
	Activity 1.1.2 Update health statistics that may be associated to water contamination
	Activity 1.1.3Identify practices to reduce the infiltration rates of agricultural practices
	Activity 1.1.4Undertake community trainings on farmers of Neiafu
Output 1.2 Septic tank impacts on groundwater reduced	Activity 1.2.1 Study to assess the amount of septic leakages in the demonstration site
	Activity 1.2.2 Undertake community awareness workshop on pollution leakages that might contaminate groundwater resources
	Activity 1.2.3 Construct the sewage disposal site
	Activity 1.2.4 Purchase the Vacuum Tank Truck
Output 1.3 Consult and address community concerns on water supplies	Activity 1.3.1 Undertake workshops/meetings to consult community concerns
	Activity 1.3.2 Qualitative and Quantitative Household survey
	Activity 1.3.3 Production of brochures, educational materials, community awareness workshops, TV and radio programmes, posters, etc.
Output 1.4 Community Demonstration Project	Activity 1.4.1 Establish Demonstration houses on water and sanitation
	Activity 1.4.2 Develop engagement strategy and Gender Mainstreaming Strategies
	Activity 1.4.3 Exchanges information Training across communities on installed sanitation options. Allow mixing of genders on training
	Activity 1.4.4 Pilot Household Water Safety Plan
	Activity 1.4.5 Develop community best household water management practices manual
	Activity 1.4.6 Support uptake of water management practices manual

COMPONENT 2: Assess water resources and water use efficiency	
Output 2.1 A Hydro-Geological survey of the aquifer and well-field area	Activity 2.1.1 Groundwater chemical and microbiological testing
	Activity 2.1.2 Test bore holes for water quality
	Activity 2.1.3 Neiafu Groundwater Assessment and Sustainable Management
	Activity 2.1.4 Staff training on G.I.S
	Activity 2.1.5 Draw a Salinity Map for Neiafu to identify the sites for bore holes
	Activity 2.1.6 Develop institutional knowledge and experience to support policy implementation
Output 2.2 Survey of water wastage and leaks in the groundwater extraction and distribution	Activity 2.2.1 Study to assess the water leakages in extraction and the distribution system
	Activity 2.2.2Develop Loss Management Plan for Neiafu system
COMPONENT 3 Governance and Project management	
Output 3.1 Establish a Committee to oversee the management of the Neiafu aquifer and a Technical Working Group for technical assistance	Activity 3.1.1 Establish the Neiafu Steering Committee
	Activity 3.1.2 Establish the Technical Working Group
	Activity 3.1.3 Project management of GEF IWRM Project
	Activity 3.1.4 Develop and implement communication strategy
	Activity 3.1.5 Develop and implement engagement strategy
	Activity 3.1.6 Develop and implement capacity building strategy
	Activity 3.1.7 Develop and implement replication strategy
	Activity 3.1.8 Establish ongoing Neiafu Aquifer Management Committee
	Activity 3.1.9 Develop and implement project participatory M&E programme
COMPONENT 4: Develop Water Resource Management Plan for Neiafu, including incentives	
Output 4.1 Develop scenarios for the future of the Aquifer (major proposed developments and their expected impacts) Output 4.2 Develop water Resource management Plan	Activity 4.1.1 Develop scenarios
	Activity 4.2.1 Develop Management Strategies
	Activity 4.2.2 Develop Financial sustainability mechanisms
	Activity 4.2.3 Write draft WRM Plan
	Activity 4.2.4 Consult on draft WRM Plan
	Activity 4.2.5 Finalize WRM Plan
COMPONENT 5: Develop and implement National Water Resource Management Policy incorporating WUE	
Output 5.1 National Water Resource Management Policy incorporating WUE Output 5.2 Capacity developed Nationally and resources allocated to implement policy	Activity 5.1.1 Support Development of National Water Resource Management Policy
	Activity 5.2.1 Support development of sustainable funding for implementation of Policy
	Activity 5.2.2 Develop national participatory indicator framework to support IWRM implementation
	Activity 5.2.3 Support the development of a national Strategic IWRM communication plan

The following table provides a summary of key results linked to the projects goal and objectives. A comprehensive review of National Results Notes linked to performance indications can be found in Annex 5.

KEY RESULTS
A 60% increase in community engagement in water management in Neiafu reflects the focus of this project on the community solving local water and sanitation challenges
The first assessment of sustainable yields from the Neiafu aquifer may ensure the long-term sustainability of an aquifer that has seen increasing salinisation due to over-pumping
The provision of infrastructure and services to meet community-led directions on providing the 5,000 Neiafu residents with access to sustainable sanitation

5.2.1 Co-financing

The following tables highlights the co-financing that was realised and the additional funding that was leveraged from success of the project activities.

5.2.2 Benefits of co-financing

The following boxes highlight examples of how co-financing and additional funding have helped to benefit the project objectives.

5.2.3 Key Awareness Materials

to be completed

5.3 Catalytic Impacts

to be completed

5.4 Participatory Planning, Monitoring, and Evaluation

to be completed

6. Strengthening National Coordination and IWRM Policy and Planning in Tonga

6.1 Linkages of Demonstration Activities with IWRM Planning

To be completed

6.2 Improving National Coordination for IWRM

To be completed

6.3 National IWRM Planning

To be completed

7. Capturing Lessons Learned for Replication and Scaling-up of IWRM Best Practice in Tonga

7.1 Lessons Learned

to be completed

7.2 Replication and Scaling-up

to be completed

8. Planning the Transition from IWRM to the Regional Ridge to Reef Initiative

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Annex 1: IWRM Project Coordinating Committee Members

Name of Stakeholder	Name	Position	Contact Number	Address	Fax	Email
Ministry of Justice Chairman	Mr. Paula Tatafu	Magistrate/Government Rep.	70-077	Neiafu, Vava'u	71-346	N/A
Governor's Office Deputy Chairman	Mrs Masina Talakai	Secretary for Vava'u Governor	70-070	Neiafu, Vava'u	70-501	tuitupou.masina@gmail.com
Natural Resources Division, MLSNR	Mr. Taaniela Kula	Deputy Secretary, Natural Resources Division	65-786/25-508	P.O Box 5, Nuku'alofa, Tongatapu	23-216	taanielakula@gmail.com
Ministry of Lands, Survey and Natural Resources	Mr. Paula Lo'amanu	Principal Surveyor	70-033	Neiafu, Vava'u	70-999	ploamanu@yahoo.com
Ministry of Health	Dr. Tevita Tu'ungafasi Leopino Fa'asolo	Doctor in Charge/ Health Inspector	878-1361/ 70-203	P.O Box 155, Ngu Hospital, Vava'u	70-203/70-204	N/A
Tonga Water Board	Waterski Ma'afu	Manager	12987/ 70-299	Neiafu, Vava'u	N/A	N/A
MAFFF (Forestry Division)	Maloni Havea	Forestry Officer	70-164	P.O Box 45, Vava'u	70-400	maloni.h@gmail.com
Ministry of Works	Sanele 'Ulupano	Load Foreman	8412065	P.O Box 145, Neiafu, Vava'u	70-983	N/A
Ministry of Tourism	Mr. Puluno Toke	Manager	70-115	TVB, P.O Box 18, Neiafu, Vava'u	70-115	tvbvv@kalianetvav.to
Church Minister	Rev. Fe'ofa'aki Fusikata	FWC Minister	N/A	Ha'akio	N/A	N/A
Meteorological Services	Faingata'a Vaitaki/Uili 'Ulingaholo	Met. Technician	79-889	Lupepau'u Airport Leiamatu'a	79-088	N/A
Town Officer's	Halafo'ou 'Otukolo Sateki Lea Talanoa Masunu Paea Sikalu Savelio Siasau	Town Officer's	N/A	Neiafu Makave Falaleu Toula Fungamisi	N/A	N/A
Tonga Trust	'Oto'ota Hala'ufia	Manager	70-874	Vava'u Youth Congress Compound Neiafu, Vava'u		70-874
Vava'u Environmental Protection Association (VEPA)	Don Blanks	Chairman	N/A	Neiafu, Vava'u	N/A	N/A
Neiafu Citizen	Tino Tofu	Former Civil Servant		'Utulangivaka, Neiafu, Vava'u	N/A	N/A
Vava'u Youth Congress	'Akosita Tu'a	Project Officer	70-662/7557643	Private Bag 39	N/A	N/A
Neiafu District Officer	Finau Sione Tupou	District Officer	14-814	Saineai, Neiafu,Vava'u	N/A	N/A
AusAID	Sipati Fusikata	Development Project	70-150/74544	Neiafu, Vava'u	70-150	sipati_1@yahoo.co.nz

Annex 2: IWRM Project Coordinating Committee ToR

TERMS OF REFERENCE FOR DEMONSTRATION PROJECT COORDINATING COMMITTEE

1. BACKGROUND

Overall Objective: Sustainable water resource assessment and protection of the fragile Neiafu
Groundwater Resources
Project Purpose: Improved understanding of the quality and quantity of surface water, groundwater, rainwater, coastal receiving waters, and their vulnerabilities to land based pollution

2. ROLE OF THE IWRM PROJECT COORDINATING COMMITTEE

The role of the **PROJECT COORDINATING COMMITTEE** is as follows:

- Provide direction and strategic guidance to the Project Management Unit and Lead Agency regarding the design and implementation of the national demonstration project;
- Meet on a monthly basis during the project inception period and a quarterly basis thereafter to guide the timely execution of national demonstration project activities;
- Receive, review and approve reports from the Project Management Unit regarding the outputs and outcomes of project activities;
- Assist the Project Management Unit in ensuring co-ordination among the national demonstration project and other national level activities undertaken during the course of the project to further enhance national capacity to develop integrated approaches to water resource management;
- Review stakeholder involvement in project activities and take action where necessary to ensure appropriate levels of government, NGO, community, and private sector engagement;
- Ensure compatibility between the recommendations for action in the demonstration project and other national level activities for Integrated Water Resource Management;
- Provide sound scientific and technical advice to the Project Management Unit and Lead Agency regarding the design and implementation of project activities, particularly with respect to the development of project performance indicators;
- Review and evaluate, at the national level, progress in implementation of the project, and provide guidance for improvement to the Project Management Unit and Lead Agency when necessary;
- Approve annual progress reports for transmission to the meetings of the regional GEF IWRM Project Steering Committee;
- Review and recommend for approval and implementation by the competent national authority, management plans and courses of action developed during the course of project execution;
- Assist the Project Management Unit and Lead Agency in leveraging required project co-financing and additional funds that may be required from time to time;
- Work with the Project Management Unit and Lead Agency in mainstreaming integrated, reef-to-ridge approaches to water resource management and the replication of project successes at the national level; and

Agree at their first meeting: a) the membership, meeting arrangements, and terms of reference of the committee; and b) such standing orders and manner of conducting business as may be considered necessary by the committee.

3. RESPONSIBILITIES OF THE PROJECT COORDINATING COMMITTEE CHAIR

The Steering Committee Chair is the IWRM Project Focal Point, Mr. Kelepi Mafi (Principal Geologist). Should the Project Sponsor be unable to attend a meeting, The IWRM Focal Point will serve as Committee Chair.
The responsibilities of the Project Management Unit under the direction of the Chair (Project Focal Point) are as follows:

- Sets the agenda for each meeting
- Ensures that agendas and supporting materials are delivered to members in advance of Meetings.
- Makes the purpose of each meeting clear to members and explains the agenda at the beginning of each meeting.
- Clarifies and summarizes what is happening throughout each meeting.
- Keeps the meeting moving, by giving enough time for each stakeholder on sharing of threat
- Encourages broad participation from members in discussion.
- Ends each meeting with a summary of decisions and assignments.
- Follows up with consistently absent members to determine if they wish to discontinue membership.
- Finds replacements for members who discontinue participation

4. RESPONSIBILITIES OF PROJECT COORDINATING COMMITTEE MEMBERS

Individual PCC members have the following responsibilities:

- Understand the objectives, purpose, and desired outcomes of the project.
- Understand and represent the interests of project stakeholders.
- Take a genuine interest in the project's outcomes and overall success
- Act on opportunities to communicate positively about the project.
- Actively participate in meetings through attendance, discussion, and review of minutes, papers and other Stakeholders documents.
- Support open discussion and debate, and encourage fellow PCC members to voice their insights.

5. GENERAL

Project Coordinating Committee memberships were selected from both Government and Non-Government Organization. They were carefully chosen accordingly to their related to the National Water Resources. Any decision making will be processes in the usual balloting ways. Meetings will be called when required, but will inform to its members less than two weeks. Agenda will be prepared by the Project Management Unit, so as the recording of the minutes and decision papers, available for its member.

Name of Stakeholder	Name	Position	Contact Number	Address	Fax	Email

Ministry of Justice Chairman	Mr. Paula Tatafu	Magistrate/Government Rep.	70-077	Neiafu, Vava'u	71-346	N/A
Governor's Office Deputy Chairman	Mrs Masina Talakai	Secretary for Vava'u Governor	70-070	Neiafu, Vava'u	70-501	tuitupou.masina@gmai om
Natural Resources Division, MLSNR	Mr. Taaniela Kula	Deputy Secretary, Natural Resources Division	65-786/25-508	P.O Box 5, Nuku'alofa, Tongatapu	23-216	taanielakula@gmail.co
Ministry of Lands, Survey and Natural Resources	Mr. Paula Lo'amanu	Principal Surveyor	70-033	Neiafu, Vava'u	70-999	ploamanu@yahoo.com
Ministry of Health	Dr. Tevita Tu'ungafasi Leopino Fa'asolo	Doctor in Charge/ Health Inspector	878-1361/ 70-203	P.O Box 155, Ngu Hospital, Vava'u	70-203/70-204	N/A
Tonga Water Board	Waterski Ma'afu	Manager	12987/ 70-299	Neiafu, Vava'u	N/A	N/A
MAFFF (Forestry Division)	Maloni Havea	Forestry Officer	70-164	P.O Box 45, Vava'u	70-400	maloni.h@gmail.com
Ministry of Works	Sanele 'Ulupano	Load Foreman	8412065	P.O Box 145, Neiafu, Vava'u	70-983	N/A
Ministry of Tourism	Mr. Puluno Toke	Manager	70-115	TVB, P.O Box 18, Neiafu, Vava'u	70-115	tvbvv@kalianetvav.to
Church Minister	Rev. Fe'ofa'aki Fusikata	FWC Minister	N/A	Ha'akio	N/A	N/A
Meteorological Services	Faingata'a Vaitaki/Uili 'Ulingaholo	Met. Technician	79-889	Lupepau'u Airport Leiamatu'a	79-088	N/A
Town Officer's	Halafo'ou 'Otukolo Sateki Lea Talanoa Masunu Paea Sikalu Savelio Siasau	Town Officer's	N/A	Neiafu Makave Falaleu Toula Fungamisi	N/A	N/A
Tonga Trust	'Oto'ota Hala'ufia	Manager	70-874	Vava'u Youth Congress Compound Neiafu, Vava'u		70-874
Vava'u Environmental Protection Association (VEPA)	Don Blanks	Chairman	N/A	Neiafu, Vava'u	N/A	N/A
Neiafu Citizen	Tino Tofu	Former Civil Servant		'Utulangivaka, Neiafu, Vava'u	N/A	N/A
Vava'u Youth Congress	'Akosita Tu'a	Project Officer	70-662/7557643	Private Bag 39	N/A	N/A
Neiafu District Officer	Finau Sione Tupou	District Officer	14-814	Saineai, Neiafu,Vava'u	N/A	N/A
AusAID	Sipati Fusikata	Development Project Officer	70-150/74544	Neiafu, Vava'u	70-150	sipati_1@yahoo.co.nz
Ministry of	Silika Ngahe	Manager	70-399	Neiafu,	70-	N/A

Fisheries				Vava'u	892	
Ministry of Environment and Climate Change	Mrs. Emeline Laumanu	OIC	70-033	Neiafu, Vava'u	70-033	N/A
Neiafu Women Development Group	Folau Tano'a, Hainite Maclean, Siunipa Finau		70547/70779/71026	N/A	N/A	N/A
Falaleu Women Development Group	Ma'u Fau'ese	Member of Falaleu Women's Development Group	N/A	Falaleu	N/A	N/A

5.2 Quorum and Decision-making

There are no really issues to be debated; all issues were raised for the better good of overall objectives. Project higher authority will decide it later of all this issues.

5.2.1 Quorum

Numbers of PCC members varied, then decision making will be based on the availability of members during each meeting, and declared to be a valid decisions. There will no actual number as a valid numbers of members to make a decision valid, it will only depends on the number of members who are willing to attend each meeting. Most Government Organization were chooses in their related to their role plays in the National Water of Vava'u. NGO were mostly interested Organization in water, such as success business, and business needed water as a highly required resources, also independent Neiafu trusted Residence including the town officer and District officer.

5.2.2 Decision-making Process

The process in which the PCC uses for any decision making will be the ***MAJORITY***, a course of action requires support from more than 50% members who attend the meeting according to the Quorum.

5.3 Frequency of Meetings

Meeting schedule were assigned accordingly to the most availability of all members of the PCC. Basically this very first meeting schedule so that members can plan ahead and arrange their attendance. Other alternatives schedule alternatives are to meet monthly, quarterly, or according to another schedule set out by the Project. Due to this long term project timeframe (5years), each following meetings will announce to its members at least three weeks before the meeting.

5.4 Agenda, Minutes, and Decision Papers

Nomination letter sent at first to each stakeholder, Invitation letter followed after knowing who they nominate to the PCC meeting.
Agenda for upcoming meeting distribute before the meeting. Previous minutes will also be keeping. Decision papers and any other documents/information will be considered at the meeting.

5.5 Proxies

Members of the PCC can send proxies to meetings. Proxies are not entitled to participate in discussion and are not allowed a role in decision-making, but observing only.

PMU will inform the Project Sponsor as soon as possible if they intend to send a proxy to a meeting and no less than two business days before the scheduled meeting.

Proposed TERMS OF REFERENCE
FOR
NATIONAL WATER RESOURCES COMMITTEE
TONGA
Background

On the 27th May 2009, the Government of Tonga approved through the King's Cabinet Decision, the establishment of a National Water Resource Committee. The Ministry of Lands, Survey, Natural Resources and Environment was approved to be the executing agency for the Integrated Water Resources Management planning process. The establishment of a water committee will greatly contribute to:

- highlighting water as a political priority;
- improved transparency and coordination within the sector;
- formulating government objectives and policies for the sector and improving access to water resources for improving water resource management.

Suggested Aims
The suggested principle aims of the Committee are to:

1. Promote the sustainable management, conservation and use of water and related land resources by coordinating and enhancing Government and community activities.

2. Facilitate and enhance initiatives to raise the quality of life by improving the quality and availability of safe water and decreasing illness and infant mortality rates due to water-borne diseases.

3. Coordinate and facilitate information gathering and assessment, policy and instrument development, and identification of other for the water sector throughout Tonga.

4. Provide broadly-based strategic advice to the Government of Tonga, the community, non-government and donor organizations on the nation's water resources service and their management and use.

Suggested Terms of Reference

It is suggested that the Committee will:

1. Coordinate and enhance the strategic activities of Government Ministries in the water sector.
2. with broadly-based, coordinated, strategic advice, incorporating agency and community views and needs, on water.
3. Provide a national forum for the discussion of water-related issues.

4. Review, assess and make broadly-based recommendations to Government on water-related policy, instruments, incentives, legislation, regulations and water plans, on priorities for water and on water-related development opportunities.
5. Monitor the implementation of Government water policy and regulations.
6. Provide an annual, national, island-based assessment of the quality and quantity of water resources, water consumption, rainwater harvesting and of demand for water.
7. Review and identify the personnel, training, education and communication needs for the water sector.
8. Develop plans for development of water services, for the nationwide protection, conservation and sustainable use of fresh water, including urban and designated growth centers, and for increasing awareness of water issues.
9. Review and prepare water quality standards, guidelines.
10. Review and develop, where necessary, relevant building codes.
11. Undertake risk assessments of the water sector in relation to global change and extreme events.
12. Develop ways to improve community understanding of and participation in water management and planning and in furthering water conservation and protection.
13. Review, assess and make recommendations on proposals for water-related projects.

RESPONSIBILITIES OF THE NATIONAL WATER RESOURCES COMMITTEE CHAIR

The National Water Resources Committee Chair is the Minister for Lands, Survey and Natural Resources, **Hon. Tuita**. Should the Chairman be unable to attend a meeting, The CEO for Lands, Survey and Natural Resources will serve as Committee Chair.

COORDINATION AND MEMBERSHIP OF THE COMMITTEE

Coordination and Reporting of the committee

The Committee will be coordinated and convened by the chairperson, Minister of Lands, Survey and Natural Resources. The Committee will report through the MLSNR to Cabinet.

Membership of the committee

Membership of the Committee is drawn from Agencies and Organizations with significant roles and responsibilities in water, climate and in planning and management, Ministry of Lands, Survey and Natural Resources (MLSNR), Ministry of Health (MOH), Ministry of Environment and Climate Change (MOECC), Ministry of Finance and Planning (MOFP), Tonga Water Bureau (TWB), Ministry of Tourism (MOT)*, Ministry of Work (MOW)*, Ministry of Agriculture and Forestry (MAF)*,

The Committee will liaise with other existing water related committees.

Annex 3: Stakeholder Analysis and Engagement Action Plan

	Demonstration Project Component 1 / 2 / 3 / 4 / 5 / 6 / 7						[For inclusion in annual workplan (and budget) if appropriate]			
	Component focus									
	1 Stakeholder (Organisation/post/ name/contact)	2 Key interests, concerns	3 How does the project affect them?	4 How supportive will they be? **++; +; =; -; –**	How much influence Very 5 – 0	6 Priority to engage Top 5 - 0	7 What do we need /want them to do?	8 What (& how) do we do to engage them? (to get what we need)	9 When do we engage them?	10 Who leads?
		Info in this column was very relevant. Well done	Info in columns 3,7 and 8 sometimes seemed to overlap. This column considers how project activities will affect/impact on the stakeholder ie , for Stakeholder 7 (Tourist Hotels) Improved water quality should increase tourists and improve profits. Will the project be "poaching" the responsibilitilites of MoH?				This looks specifically at what are the contributions that we need the stakeholders to make to the project. Mostly you have completed this very well – but you might like to check entry 4 Ministry of Tourism	Individual consultations? Joint planning? Joint review? Regular meetings? Steering Committee or working group meetings? Newsletters? Field visits?	At project start will be true, but after that and throughout the 5 years? Will there be 1/4ly joint planning or joint review sessions, or monthly meetings or ?	Who leads in the process of engaging the stakeholder? In the PMU or the lead agency or a steering committee member or?
1.	Neiafu District Officer	As a sign off cared for community needs and representing	The project will generate reliable supply of water for the people, therefore, this will increase their reputations and so people will listen to them.	=	2	1	Encourage people to corporate with the project's scopes. Use influential supporters as figure heads.	Special Workshop that will enhance their understanding on project purposes		District Officer
2.	Ministry of Justice	Justice is needed when there is disagreement between managers and consumers of water resources. Therefore, this Ministry is interested in the Monitoring and		+	5	3	Maintain the objectives of the project and leads into in so that goal will be overcome	Consultation always with		Chief Magistrate

		compliance based on Water Resource Management Bill.								
3.	Ministry of Health	Same direction as their Ministry's responsibilities	The activities will help MOH achieve their goal of reducing diseases that associated with waterborne causes, as well as the minimizing impacts of sewage and liquid waste practise will fit into their goal of hygiene environment. But, some of the activities will force the MOH to strengthen their power on sewage and liquid waste practices over some of foreign businesses where most income of the economy comes from.	++	5	5	Follow a trend of information on water quality	Initiate related work and formulate for their information		Doctor in Charge
4.	Ministry of Tourism	For reliable source of water for tourism Industries		++	5	5	Reach out to tourism industries with awareness program and provide correct information especially wastewater dumping	Provide as much tourism materials that will clearly explain the desperate needs of cooperation to protect water		Officer in charge
5.	Tonga Water Board	Supplying, distribution, management, maintenance, information, etc.	Project will reveal their weaknesses in operating the public water services	++	5	5	Fully engage in information and access to water supply system	Plan and continuously monitor the system		Manager
6.	Department of Environment	Activities in project to save, protect water also a benefit of environmental conservation too		++	5	5	Expertise	Join in Site visits, implementations, reviewing and act as lobbying senior decision maker.		Officer in Charge
7.	Vava'u Hotels etc	There is a need for an adequate and reliable supply of water. They also needed to enforce the recovery and recycling of water and reductions in losses in the system for the sake of their business.	They are one of the most high amount of discharge of wastewater and they don't want that issue to brought up	--	1	5	Reduce in discharging their liquid wastages straight into the ocean, as well as High profile public support.	Join in site visits and planning discussions.		Officer in Charge
8.	Neiafu Women Development Group	Well done on identifying this as a stakeholder. Do you also have Youth Groups?	This project will help the chores of women at home by preventing shortages supplying of water.	-	3	3	mobilise and build awareness among the women	Use influential supporters as figure heads.		Member
9.	Tonga Trust		Most of their members are very interested in this project and might make them loose interest in participating in their meetings.	-	1	3	Co-financing and Human resources supports.	planning and consultation		Manager
10	Ministry of Works	Of all the project activities, this ministry emphasis the idea of buying a septic tank truck. This is to reduce	One of the responsibilities of MOW is to take care of water wastages. The project is providing a vacuum tank truck which help minimize	--	0	3	Participate and advice on technical activities of	Consultation, collaboration towards the proposal Resources		Foreman

		truck. This is to reduce the water wastage and leaks in the groundwater.	truck which help minimize impacts of waste practices.				project				
11	Neiafu Community	They really want to have a very reliable water supply.	The project will give them nothing but less shortage and unreliable supplying of water.	++	3	5	Prepare their own awareness program that will be able them to arrange on their own situation	Provide Information and give hints such as funding community activities		Representative
12	Vava'u Youth Congress	They want high quality of water, reliable and a good monitoring of water resources.	The project will give good quality of water supply.	++	4	5	Collaboration and incorporation of activities into their work plans.	Join in site visits and act as supporters		
13	Ministry of Finance	Financially difficulties happen due to misunderstanding between financial and Project objectives and goals.		=	1	5	Understand the project purpose and support project for solution to circulate financial transaction of Project mush easier	Liaise with them in any donor policy that will allow flexibility in project service		Treasurer
14	Ministry of Lands, Survey and Natural Resources	Natural Resources Policy to apply accordingly		+	5	3				Officer in Charge
15	Peace Corps			+	2	2				Representative
16	Ministry of Agriculture, Food, Forest	The effect of agricultural practices is a direct threats to project purposes	Farming needs fertilizers and pesticides, will have to be reduce	++	5	5	Conduct agricultural chemical awareness and study to avoid and records of effect	Training and agricultural awareness to be directly deliver to farmers and its effect to water source		Representative
17	Ministry of Fisheries	Coastal Environmental Protection		++	5	5	Protection of the coastal water area and really apply any measurement to reduce and avoid further discharge and abuse of costal water	Monitor continuously and put up a research that will clear any source of contamination		Officer in Charge
18	Development Section	Way that foreign aid will able to assist in providing fund		=	2	5	Connect the project activities to foreign donor in which project will have co-finance and further activities	Cooperate in private meeting to put up issues and push more. Layout proper programs of same purpose as project and await financing		Staff

PROJECT DESCRIPTION	INDICATOR	MEANS OF VERIFICATION	ASSUMPTIONS/ RISKS	LEAD
GOAL: Sustainable water resource assessment and protection of the fragile Neiafu Groundwater Resources	Sustainable Assessment and Protection of water resource has been achieved and completed	Endorsement of Steering Committee and Community Engagement		
PURPOSE: Improved understanding of the quality and quantity of surface water, groundwater, rainwater, and their vulnerabilities to land based pollution	Community workshops and trainings, Successful Monitorings, reviews, minimizings, testings, undertake studies and surveys has improved the understanding on water resources and their vulerabilities to land based pollution	Project Management Unit will arrange all activities, and endorse by Neiafu Steering committee throughout the life of the project		
COMPONENT 1: Mitigate Threats from Contaminants	By end of project: 25% reduction in nutrients in sewage pollution across Vava'u 30% increase in population with access to safe water supply 90% increase in Neiafu residents with access to improved sanitation 30% increase in stakeholder engagement	Pumpout truck and sludge disposal site in use System loss management plan endorsed by NSC Household water safety plans implemented by 30% of Neiafu houses		
OUTPUT 1.1 Improved agricultural practice and land use that protect the aquifer and human health	Studies on pollution and health statistics, best practices manual and training completed	Endorsement by NSC	Incooperation of Steering Committee's Responsible parts	
ACTIVITY 1.1.1 Undertake a Study to assess the extent of groundwater pollution from agricultural practices	Study and assessment is completed by September 2011	Endorsement of NSC	Time for the Procurement Process may cause delays	
ACTIVITY 1.1.2 Update health statistics that may be associated to water contamination	Study Report by Dec 2011 with annual updates	Neiafu Steering Committee endorsement	Adequate informations available is obtained to provide confidence in results	
ACTIVITY 1.1.3 Identify practices to reduce the groundwater pollution from agricultural practices	Report on Best practices by Sep 2011	Endorsement of Steering Committee	Cooperation of the farming community	
ACTIVITY 1.1.4 Undertake community training on farmers (both women and men) of Neiafu. Train Farmers to train other farmers	Re-visit to demonstrate improved practice by Dec 2011	Endorsement of Steering Committee	Cooperation of the farming community	
	Report on implementation of strategy, demonstrating: 30% increase in stakeholder		Assumed that the community will cooperate in minimizing	

OUTPUT 1.2 Septic tank impacts on groundwater reduced	engagement 25% reduction in nutrients in sewage pollution across Vava'u 90% increase in Neiafu residents with access to improved sanitation	Endorsement of Steering Committee	the impacts of septic tanks can be simplified to provide successful results	
ACTIVITY 1.2.1 Study to assess the amount of septic leakages in the demonstration site	Study Report on the outcomes of the assessment by November 2011	Endorsement of Steering Committee	Cooperation of the community	
ACTIVITIY 1.2.2 Undertake community awareness workshop on pollution leakages that might contaminate groundwater resources	Improvement in septic system management by March 2012	Audit of the community septic practice	Cooperation of the community	
ACTIVITY 1.2.3 Construct the sewage disposal site	Operating by Dec 2010	Receive first truck	Contractors' performance	
ACTIVITY 1.2.4 Purchase the Vacuum Tank Truck	Presentation of the Vacuum Tank Truck by Dec 2010	Letter of Acceptance to Ministry of Health	Truck condition is not what is claimed	
OUTPUT 1.3 Consult and address community concerns on water supplies	Consultation and addressing community concerns Report	Endorsement of Steering Committee	Changes in community commitment, responsibility and focus	
ACTIVITY 1.3.1 Undertake workshops/meetings to consult community concerns	Adopted Minutes of workshops/ meetings 30% increase in gender balanced community and wider stakeholder engagement in water related issues by Q4 2011, Q22012, Q42012	Endorsement of workshop reports by Steering Committee	Changes in Community Commitments, responsibility and focus	
ACTIVITY 1.3.2 Qualitative and Quantitative Household survey	Survey Report on households' water supplies by Dec 2010 and annual surveys in 2011 and 2012	Endorsement of Steering Committee	Weather Disturbance; Incooperation of Community	
ACTIVITY 1.3.3 Production of brochures, educational materials, community awareness workshops, TV and radio programmes, posters, etc.	Delivery of communication strategy by Q4,2011	Endorsement of reporting against communication strategy by Steering Committee	Changes in Community Commitments, responsibility and focus	
OUTPUT 1.4 Community Demonstration Project	Consultation and addressing community concerns Report	Endorsement of Steering Committee	Changes in community commitments, responsibility and focus	
ACTIVITY 1.4.1 Establish Demonstration houses on water and sanitation	12 Demonstration sites established with improved water collection, water use and sanitation options by end June 2011	Endorsement of Steering Committee	Changes in Community Commitments, responsibility and focus, Individual household commitment	
ACTIVITY 1.4.2 Develop engagement strategy and Gender Mainstreaming Strategies	Enagagement strategy completed by Dec 2011	Endorsement of Steering Committee	Indivdual household commitment	

PROJECT DESCRIPTION	INDICATOR	MEANS OF VERIFICATION	ASSUMPTIONS/ RISKS	LEAD
ACTIVITY 1.4.3 Exchanges information Training across communities on installed sanitation options. Allow mixing of genders on training	6 Community Exchanges completed by Dec 2011 and June 2012	Reporting by communities to NSC	Community commitment Individual household commitment	
ACTIVITY 1.4.4 Pilot Household Water Safety Plan	Household level Water Safety Plan completed by March 2012	Endorsement of Steering Committee	Community commitment Individual household commitment	
ACTIVITY 1.4.5 Develop community best household water mangament practices manual	Community best wate management practices manual by March 2012	Endorsement of Steering Committee	Community commitment Individual household commitment	
ACTIVITY 1.4.6 Support uptake of water management practices manual	Survey on proportion of households applying manual by March 2013 30% increase in population with access to safe water supply	Endorsement of Steering Committee	Community commitment Individual household commitment	
COMPONENT 2: Assess water resources and water use efficiency	National staff across institutions with IWRM knowledge and experience Better understanding of groundwater through testing and modelling	Endorsement of Reports by PSC		
OUTPUT 2.1 A Hydro-Geological survey of the aquifer and well-field area	Survey Report	Endorsement of Steering Committee	Assumed to obtain accurate data for confident records	
ACTIVITY 2.1.1 Groundwater chemical and microbiological testing	Initial Assessment Report by March 2011 6 monthly monitoring reporting until Sep 2012	Endorsement of Steering Committee	Poor performance of the contractors for future monitoring	
ACTIVITY 2.1.2 Test bore holes for water quality	Assessment Report by Dec 2012	Endorsement of Steering Committee	Poor performance	
ACTIVITY 2.1.3 Neiafu Groundwater Assessment and Sustainable Management	Report and Model Completed by Dec 2011	Endorsement of Steering Committee	Poor performance, Availability of data from Water Board and Hydrogeology may complicate modelling	
ACTIVITY 2.1.4 Staff training on G.I.S	GIS system installed and staff trained by Mar 2011	Endorsement of Steering Committee	Poor performance on installation, Travel Cancellation of consultant	
ACTIVITY 2.1.5 Draw a Salinity Map for Neiafu to identify the sites for bore holes	Salinity Map completed by Mar 2011	Endorsement of Steering Committee	Poor performance	
ACTIVITY 2.1.6 Develop institutional knowledge and experience to support policy implementation	Increase in national staff (both men and women) across institutions with IWRM knowledge and experience by end of project	Survey endorsed by APEX Body	Political will	
OUTPUT 2.2 Survey of water wastage and leaks in the groundwater extraction and distribution	Survey Report on water leakages in groundwater extraction and distribution	Endorsement of Steering Committee	Political commitment	

ACTIVITY 2.2.1 Study to assess the water leakages in extraction and the distribution system	Assessment Report complete by September 2011	Endorsement of Steering Committee	Poor performance	
ACTIVITY 2.2.2 Develop Loss Management Plan for Neiafu system	Loss Management Plan (including equipment) complete by Dec 2011	Endorsement of Steering Committee	Poor performance; Cooperation of TWB	
COMPONENT 3 Governance and Project management	Lessons learned incorporated into other project(s) and /or Regulations Replication strategy developed and implemented to mainstream lessons learned Project design and PM&E plan implemented by August 2011			
OUTPUT 3.1 Establish a Committee to oversee the management of the Neiafu aquifer and a Technical Working Group for technical assistance	Establishment of the Technical Working group for management	Endorsement of Steering Committee	Political will and enabling budget environment	
ACTIVITY 3.1.1 Establish the Neiafu Steering Committee	Committee Established, Committee Endorsed by Dec 2010 with quarterly meetings	Letter of endorsement Minister, Minutes of meetings	Political Will and recruiting committee members	
ACTIVITY 3.1.2 Establish the Technical Working Group	TWG Established by Dec 2010	Minutes of first meeting presented to the Steering Committee	Identifying appropriate skillful people	
ACTIVITY 3.1.3 Project management of GEF IWRM Project	Project design and PM&E plan implemented by August 2011 Project completed on time and on budget	Quaterly and Annual Reports, mid-term and end of project audit	Poor communication between PCU, Poor performance	
ACTIVITY 3.1.4 Develop and implement communication strategy	Communication Strategy completed by Dec 2010 Annual Reviews Improved cross-sectoral communication by end of project	Endorsement of Steering Committee	Stakeholders cooperation	
ACTIVITY 3.1.5 Develop and implement engagement strategy	Engagement Strategy completed by Dec 2010 Annual Reviews	Endorsement of Steering Committee	Stakeholders cooperation	
ACTIVITY 3.1.6 Develop and implement capacity building strategy	Capacity Building Strategy implented by Dec 2010	Endorsement of Steering Committee	Stakeholders cooperation	
ACTIVITY 3.1.7 Develop and implement replication strategy	Replication Strategy implented by Dec 2010 Replication Toolkit, National scaling-up by June 2013, including inclusion of lessons in national project activities and/or regulations	Endorsement of Steering Committee Endorsement of APEX body	Stakeholders cooperation	

PROJECT DESCRIPTION	INDICATOR	MEANS OF VERIFICATION	ASSUMPTIONS/ RISKS	LEAD
ACTIVITY 3.1.8 Establish ongoing Neiafu Aquifer Management Committee	Committee Established, Committee Endorsed by Dec 2012	Letter of endorsement Minister, Minutes of first meeting	Political Will and recruiting committee members	
ACTIVITY 3.1.9 Develop and implement project participatory M&E programme	Participatory M&E programme by Jun 2012 Project Reporting incorporating M&E Results	Endorsement of Steering Committee	Stakeholder cooperation	
COMPONENT 4 Develop Water Resource Management Plan for Neiafu, including incentives	Develop IWRM Plan for Neiafu by end 2012	Endorsement of Minister	Changes in stakeholders roles, responsibility and focus; Political will	
OUTPUT 4.1 Develop scenarios for the future of the Aquifer (major proposed developments and their expected impacts)	Development and implementation of scenarios by June 2011	Endorsement of Steering Committee	Changes in stakeholders roles, responsibility and focus; Political will	
ACTIVITY 4.1.1 Develop scenarios	Report on the development of scenarios by Sept 2011	Endorsement of Steering Committee	Poor performance of the Project Management Unit	
OUTPUT 4.2 Develop water Resource management Plan	Study Reports	Endorsement of Steering Committee	Assumed adequate skilled people can be attracted	
ACTIVITY 4.2.1 Develop Management Strategies	Management Strategies Report by Mar 2012	Endorsement of Steering Committee	Incooperation of the responsible members	
ACTIVITY 4.2.2 Develop Financial sustainability mechanisms	Report on finance options by Mar 2012	Endorsement of Steering Committee	Political will and community cooperation	
ACTIVITY 4.2.3 Write draft WRM Plan	Drafted WRM Plan by June 2012	Minister endorsement for consultation	Political will	
ACTIVITY 4.2.4 Consult on draft WRM Plan	Consultation Report by Sep 2012	Endorsement of Steering Committee	Community Engagement	
ACTIVITY 4.2.5 Finalize WRM Plan	WRM Plan by Dec 2012	Endorsement by Minister	Political will	
COMPONENT 5 Develop and implement National Water Resource Management Policy incoporating WUE	National IWRM Strategy in place by mid 2012 National Legislation in Place by mid 2012 Discrete Budget Line for IWRM in place by mid-2013 20% increase in National budget allocated to IWRM and WUE Best approaches to IWRM and WUE mainstreamed into national and regional planning frameworks by mid-2012 National IWRM indicator framework embedded in formal national reporting Country staff trained in monitoring and PM&E Increased sectoral engagement in formal multilateral communication on water issues	Policy endorsed by Cabinet	Co-funded Component subject to co-funding partner's priorities, resources and timeframes; Political will	

	water issues National adoption of PM&E approaches implemented by July 2012 National IWRM communication plan framework implemented by July 2012 Multi-sectoral APEX body in place by July 2010			
OUTPUT 5.1 National Water Resource Management Policy incorporating WUE	Policy document	Endorsement by Cabinet	Co-funded Component subject to co-funding partner's priorities, resources and timeframes; Political will	
ACTIVITY 5.1.1 Support Development of National Water Resource Management Policy	National Water Resource Management Policy	Endorsement by Cabinet	Co-funded Component subject to co-funding partner's priorities, resources and timeframes; Political will	
OUTPUT 5.2 Capacity developed Nationally and resources allocateed to implement policy	20% increase in national budget for IWRM activities by 2012	Endorsement by Cabinet	Co-funded Component subject to co-funding partner's priorities, resources and timeframes; Political will	
ACTIVITY 5.2.1 Support development of sustainable funding for implementation of Policy	20% increase in national budget for IWRM activities by 2012	Endorsement by Cabinet	Co-funded Component subject to co-funding partner's priorities, resources and timeframes; Political will	
ACTIVITY 5.2.2 Develop national participatory indicator framework to support IWRM implementation	National partipatory M&E Framework established APEX body using Most Significant Change (MSC) and reflection and learning techniques Relevant national staff trained in participatory M&E methods	Endorsement by Cabinet Annual indicator reporting to Cabinet APEX Body Minutes Training Records Records of PM&E Consultation	Political will	
ACTIVITY 5.2.3 Support the development of a national Strategic IWRM communication plan	National Strategic IWRM Communication Plan	Endorsement by APEX body	Co-funded Component subject to co-funding partner's priorities, resources and timeframes; Political will	

Annex 5: Results Notes

Implementing Sustainable Water Resource and Wastewater Management in Pacific Island Countries

GEF PACIFIC IWRM PROJECT RESULTS NOTE

http://www.pacific-iwrm.org/results RSC 5 2013

Improvement and Sustainable Management of Neiafu, Vava'u's Groundwater Resource

Groundwater monitoring of Neiafu Aquifer

Setting up sanitation monitoring

Top 3 Project Results

1. A 60% increase in community engagement in water management in Neiafu reflects the focus of this project on the community solving local water and sanitation challenges
2. The first assessment of sustainable yields from the Neiafu aquifer may ensure the long-term sustainability of an aquifer that has seen increasing salinisation due to over-pumping
3. The provision of infrastructure and services to meet community-led directions on providing the 5,000 Neiafu residents with access to sustainable sanitation

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1. PROJECT OBJECTIVE

Sustainable water resource assessment and protection of the fragile Neiafu Groundwater Resources through:
A. Mitigation of threats from contaminants;
B. On-the-ground protection; and
C. Development of a Water Resource Management Plan

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2. RESULTS: PROCESS

By focusing on stakeholder engagement, the project has supported a community with failing sanitation systems and minimal understanding and engagement in water and sanitation management, the project has strongly engaged the Neiafu communities into developing and implementing targeted solutions to local water and sanitation challenges.

Figure 1 Community Audits of Rainwater Tanks

The formation and subsequent work of the Neiafu Aquifer Management Committee has been pivotal in the changes seen. With strong commitment to awareness raising and capacity building programs, this committee has raised community awareness and stakeholder engagement. This significant increase in community engagement has enabled targeted strategies to be delivered to improve household water and wastewater management and agricultural practices.

The aquifer management committee was a new concept in Tonga, as is the current development of an aquifer management plan, piloting aquifer management strategies in the Pacific region. This has been supported by the first assessment of sustainable groundwater yields from the aquifer and the identification of system leakage. Both of these studies should support important decisions managing local water resources.

The project has re-invigorated the Tonga APEX body, which had not met for over a year, and is supporting the development of a national indicator framework and IWRM planning.

2013 update: The project has continued to strongly engage the Neiafu communities by improving local people's knowledge on water quality and quantity. All the primary schools within Neiafu were visited in the weeks leading up to Blue Ribbon Week by the IWRM team and participating NGO's. The schools were made aware of the purpose of Blue Ribbon Week and the importance of working together to look after our valuable water

resources. The schools were then asked to create costumes and posters of sea animal to incorporate latest coastal project into integrated water management. Additionally the schools created a poem and song about water. Their context of their poems and songs indicates the improvements of people's understanding on water quality and quantity.

Water Safety Planning (WSP) workshop with members from all the different districts and relevant Ministries participating was held. This was a continuation of a 3 day workshop conducted in October of 2012, that covered conducting water collection and storage surveys, simple water treatment methods, septic system awareness and surveys, water wise use and water quality testing. All the participants are now the "Water Champions" within the community. The participants of the WSP workshops also contributed to the development of a household water safety manual. The final edits are being completed on the manuals and will be distributed within the Neiafu districts in the coming weeks. The 'Water Champions" will run additional water safety planning meetings within the communities and distribute the water safety plans with assistance of the IWRM team.

The primary purpose of the Project's scenario assessment was to assess future demands and available groundwater resources in the Tonga Water Board (TWB) well field near Neiafu in order to determine appropriate management practices for both the groundwater resources and the water supply system.

2(a) INDICATOR#1: PROPORTION OF COMMUNITY ENGAGED IN WATER RELATED ISSUES

At the project inception, communities were not engaged in the centrally-controlled water management in Neiafu, to the point where householders were forbidden from fixing household problems without written permission from government. The aim of the project was to increase active community participation by 30%. Household surveys indicated a lack of knowledge on the importance of managing of water resources and sanitation and there were few opportunities for communities to be engaged in water management, with no power in decision making.

The project has dramatically raised community engagement through consultative meetings, direct engagement on the Steering Committee and several community initiatives, such as household audits. Gender mainstreaming and community engagement initiatives have been met with strong positive community responses, with a demonstrable increase of about 60% in community engagement in both awareness raising and active engagement activities. People now have the opportunity to state their opinions in an open forum and to use their local knowledge and skills on managing water resources.

In the first quarter of the year 2013, there was almost 100% attendance at awareness activities. NGOs, private sectors and Primary Schools have joined the project's awareness activities. Women are starting to form up more development groups and there is an emphasis on Water Safety planning at the household level.

Figure 2 Falaleu Community Training

Figure 3 Fungamisi Community

Communities have actively participated in our Water Safety Planning workshop. They are now the Water Champions and will contribute to the development of a household water safety manual. The

'Water Champions" will run additional water safety planning meetings within the communities and distribute the water safety plans with assistance of the IWRM team.

Figure 4: Neiafu Water Champions (Endorsed in March 2013)

2(b) INDICATOR#2: AQUIFER MANAGEMENT COUNCIL ESTABLISHED

The centralized management of Neiafu's aquifer prior to this project meant that decisions were often made with minimal local input and in turn, the Neiafu community had minimal understanding or ownership of their water resources. Under these arrangements, there was limited understanding of how to protect the aquifer, or even the need to do so, and the lack of an aquifer management plan or an understanding of the resources had resulted in over-pumping and salinisation of many wells. The aim of the prject was to establish and endorse an Aquifer Management Committee or Council.

The establishment of the Neiafu Aquifer Management Committee has rapidly addressed several of these issues. The raise in knowledge and capacity of the committee has been reflected in the broader community with targeted communication and capacity building strategies through a community-focused subcommittee. The committee and community ownership of the aquifer has been fundamental in the successful re-establishment of septic pump-out and disposal systems, providing broad access to sustainable sanitation in Neiafu.

The Neiafu Aquifer Management Committee is empowering local communities through the establishment of town water committees for each community in Neiafu, to plan their own water resources, reduce threats to groundwater, increase the safety of household drinking water and reduce waste of resources in water loss (leaks and careless). The project is supporting the Neiafu Aquifer Management Committee and town water committees in the development of an aquifer management plan and establishing a policy and funding framework to sustain these committees beyond the project. The committee not only works with freshwater resources but is now considering coastal resources as well.

Figure 5: Neiafu Aquifer Management Committee Members (30th of May 2012)

2(c) INDICATOR#3: MULTI-SECTOR APEX BODY ESTABLISHED

Prior to the project, the APEX Body had stopped meeting and no longer provided a focus for national water management. Decisions of individual agencies were being made in isolation, and the National Water Bill and National Water Policy progress had stalled. The project aimed to establish an APEX body for the coordination of water issues in Tonga.

The project reinvigorated this committee through a targeted retreat at the project site, bringing the members together and identifying strategies to increase sectoral and national coordination. During this retreat, the Neiafu Aquifer Management Committee and the APEX body worked closely on strategies to improve groundwater management and increase community engagement in water management. The APEX Body has subsequently progressed the National Water Bill and National Water Policy and was fundamental in supporting the development of a co-funded AusAID project to extend the GEF IWRM demonstration project to an integrated water and coastal management (IWCM) project. The APEX body holds regular bi-annual meetings and remains a strong influential body for the development of water management plans, including the upcoming Implementation for Water Management Bill.

Figure 5 APEX BODY members at the meeting in Vava'u (demonstration site)

2(d)INDICATOR#4: Community Engagement

Prior to the project there was limited engagement of the community in water issues. The aim was to increase this to alt least 30% of the demonstration population. World Water Day Event is the most successful engagement activity in Vava'u. All Primary Schools of Neiafu District all participated with original traditional poems and songs. Ministry of Education and Training supported the World Water Day Event through the Blue Ribbon Week. Other Ministries were wearing the IWRM Blue Ribbon or wear Blue for the whole week. Women Development Groups, NGOs, and private sectors were participated in the parade and the exhibitions.

Figure 6: Neiafu Primary Schools' Parading GIO Recycling (Private Sector) during the WWD Exhibition

Figure 7: Neiafu Women Development Group Exhibition (NGO) and VEPA Exhibition (NGO)

Figure 8: TCDT Exhibition (NGO)

2(e)INDICATOR#5: Replication of IWRM on Coastal Management

The project aimed to replicate the lessons learned into other projects or regulations by the end of the project. An additional fund from the AusAID through the SPC is now being managed by the Neiafu Aquifer Management Committee to replicate the IWRM skills on coastal management. I would like to give the credit to Mr. David Duncan for all his assistance, without his guidance and his professional leadership on Vava'u Project, the committee would not have this implementation.

Figure 9: Integrated Water and Coastal Management Committee also Integrated Water Resources Management Committee now a bind committee for both water and coastal management Project

2(f)INDICATOR#6: Population with access to safe water supply

At the commencement of the IWRM project there was limited access by people to a safe water supply. Of the number of households in Neiafu 30% had unreliable access to a safe water supply (2010 Preliminary Survey Result for houses do not have rainwater tanks). The target of the project was a 30% increase in access to safe water supplies in Neiafu (approximately 1,500 people).

The scenarios for the estimated present water system loss showed that all scenarios are exceeding the desired sustainable pumping rate. However, in the case of an improved water loss from the piped system, the scenarios do not exceed the sustainable pumping rate over the 20 year time period. The investigations of the scenario development have been endorsed by the steering committee and have aided in the development of the Water Resources Management Plan. Draft IWRM Plan has been completed; still there is no chance of endorsement from National Water Resources Management Committee due to overseas travel of its member. Implementation of the Water Safety Planning in district level is currently ongoing. IWRM Project received kind assistance (AusAID) in enabling the project to funds the finalization and printing of the manual. There are 1200 copies *(600 Tongan version, 600 English Version)* that were printed, and Project has already conduct training of the distributors in requires resources needed for the process of distribution to be successful.

Confirmation, there are more than 700 copies that are already distributed especially to the Project communities and stakeholders and are open to other communities in the island.

2(g) INDICATOR#7: Project Design and PM&E plan implemented

For the successful implementation of the project it was necessary to develop the project design and PM&E plan. This was to be completed by August 2011 and endorsed by the project Steering Committee

PMU through community consultation has enabled to complete this part. Project Monitor & Evaluation was conducted on communities' level, and from our view the communities are now eager to participate and commit to the betterment of the whole community.

Figure 10: One of the community consultation in two different communities in Vava'u

2(h) INDICATOR#8: National staff across institutions with IWRM knowledge and experience

Prior to the projects implementation there was limited knowledge of IWRM practices and concepts. The aim of the project was to show an increase in staff knowledge and experience, or by proxy through training and work roles.

The IWRM Project has supported opportunities for the National officer to engage and participate in available training related to IWRM. The Project Assistant attended a JICA Water Resources Conversation Management workshop in Island Area Training in Japan in 2010 and a MoH Food and Water Safety Training in 2011 in Nuku'alofa. The Project Manger completed a Post Certificate study on Water Resources Management, and is currently undertaking a Master in Water Resources Management in Brisbane, Australia. These trainings have increased the knowledgeof the IWRM Project team and have created an environment that is knowledgeable on IWRM processes and concepts.

2(i)INDICATOR#9: Sectoral engagement in formal multilateral communication on water issues

Prior to the IWRM project there was no sectoral engagement in formal multilateral communication on water issues which created a fragmented environment for addressing water challenged in Tonga. Through the project sought to increase this engagement.

The project supports the participation from established committees, and aimed to increase engagement of the water and other related sectors they represent. Despite the different agendas of different committees, from the project views to the ongoing meetings proved the engagement each stakeholder represents. The project is influenced by this engagement, such as technical contribution in technical committee meetings that have supported the project in technical decisions, task force (Water Champions), steering committee, and National committee.

Figure 11: Technical Group Meeting

Figure 12: Television Program by PMU and Project stakeholder

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3. RESULTS: STRESS REDUCTION

Neiafu relies heavily on groundwater for water supply. However, the sustainability of this resource is threatened by a combination of pollution from septic tanks and agricultural practices and over-pumping to supply water through a system with significant leakages. The project is addressing both these threats through a combination of on-ground works, guideline development, targeted training, community engagement and overarching IWRM strategies and plans.

Prior to the project commencement septic tanks were failing across Neiafu due to a lack of pump-out facilities. This challenge has been addressed through the establishment and operation of pump-out facilities, supported by awareness campaigns to support uptake. Further reductions have been achieved through the installation of eleven trial sanitation systems, including a compost toilet.

Studies have identified agricultural impacts and training has been provided to farmers to improve land management practices and reduce threats to the groundwater.

Assessments of sustainable groundwater pumping rates and supply system leakage have identified key areas for improvement to mitigate stresses on the aquifer.

A guideline development of scenario gives guidance into future development and future stresses on groundwater and how that might be dealt with. It assesses future demands and available groundwater resources in the Tonga Water Board (TWB) well field near Neiafu in order to determine appropriate management practices for both the groundwater resources and the water supply system. The likely impacts to the future water resources with a risk rating were developed to determine the likelihood and the intensity of potential risks and/or hazards. Events that are most likely to occur and have a moderate to major impact on the future water demand and supply were used to develop the 4 Scenarios over 10 and 20 year projections. The factors included, population growth, increased tourism and prolonged drought conditions and all scenarios were done under current and reduced water loss from the piped system.

Target training was done as a guideline for a safety plan on drinking water at a household level. The workshops covered topics such as conducting water collection and storage surveys, simple water treatment methods, septic system awareness and surveys, water wise use and water quality testing.

Community engagement during the Word Water Day Event, enhanced the idea of water sustainability within the communities of Neiafu.

Figures 13 & 14: Workshop on the proper handling and use of agrochemicals

Figures 15 & 16: Nutrient monitoring in to assess reduced nitrogen discharges to groundwater. Sampling site (left) and testing (right)

3(a) INDICATOR#1: NITROGEN POLLUTION DISCHARGED TO GROUNDWATER IN NEIAFU

Prior to the project commencement, Neiafu had been without septic tank service facilities for many years, causing many of the town septic tanks to fail, creating unsanitary conditions around many tanks and dramatically increasing groundwater pollution. At the request of the Neiafu community, the project reestablished a septic pump-out management system. Households were surveyed to identify failing septic tanks and advice provided through a combination of media (television, radio and a school-based awareness competition). Trial sanitation systems have been installed to demonstrate reduced groundwater impacts, including sand filtration and compost toilets.

The pump-out service has been established with a sustainable financial model and has already been used by approximately 20% of Neiafu households, representing a 5% reduction in nitrogen and organic pollution of groundwater. It is anticipated that, by project completion, the target of 20% reduction in nitrogen pollution of groundwater will be achieved. This will be augmented by almost complete reduction of pollution from the eleven demonstration site households.

The Project was aiming to treat liquid waste from infiltrate directly from the septic system into the environment. The coming choice of demonstration to be made was sand filter system and compost toilet. Sand filter system was a biological treatment method of 2 filtration tank is buried in a level of the septic storage, in which the liquid waste is gravitationally overflow from septic to the 1st then to the 2nd treatment tank, in which the liquid waste is allow with requires time to treat naturally through the tanks fills with sands and gravel of different sizes. Treatment through filtration then to microbiological activities such as anaerobic processing is expect to happen during this naturally treatment method. Tests have been made on the outlet of the 2nd tank and believe to be very effective regards the presence of nutrients.

The operation of the Project pump-out truck has been servicing satisfactory to the whole island of Vava'u. It has now pump-out more than 200 trucks since operate, proved of it's so needed by the island. This waste is discharge to a simple sewage construct by the project, where layers of rocks, gravel up to fine sand sizes on top. This is a simple primary treated sewage that proves to reduce more than 60% of the discharge contamination to the environment. Project is having a challenge of this sewage where it cannot accommodate the needs of the whole island, since this project was demonstrated to the urban town of the island only, while the project committee makes exception in allow the pump-out truck to service to the whole island.

After participating in the Water Safety Planning Workshop, people now understand proper septic construction and how the leakages from septic tanks can affect groundwater quality. Pump-out services are now popular in the whole of Vava'u.

Figures 17 & 18: Vacuum truck and sludge management beds at Kalaka Site

3(b) INDICATOR#2: REDUCTION IN WATER LEAKAGE LOSSES IN VAVA'U

The Neiafu town water supply (approx. 5,000 people) is groundwater sourced; however over-pumping of some wells has increased water supply salinity to levels that are approaching undrinkable. The need for the high level of pumping was thought to be high system losses; however no reliable assessment had been undertaken prior to this project. The project aimed to reduce water leakages by 40%.

Figure 19 Old infrastructure associated with 70% leakage losses. A key study suggest that old valves may be contributing significantly to losses

Figure 20 Leak detection in Neiafu

As part of the project an assessment on Neiafu Groundwater and sustainable management has been completed, which identified 70% water losses. This figure is much higher than previously anticipated and has focused thinking on cost-effective responses. The assessment concluded that the majority of water loss was attributable to failing old infrastructure, including leaking pipes and valves. The project is working in partnership with Tonga Water Board to reduce water leakage from the system through a combination of leak detection, targeted on-ground works and system management.

Additional water leakage losses are being targeted by the project at the household level, with audits being undertaken to identify household losses and improve household water use efficiency. This work is being supplemented by trial household level treated wastewater reuse schemes.

The Neiafu Aquifer Assessment Report of the GEF IWRM Project has reported to the National Water Resource Committee and it emphasized on the 70% leakages in Vava'u. At the moment the Tonga Water Board is negotiating for funds that can reduce the leakages.
Awareness program is still reminding the communities on all land-based pollutions that can affect groundwater resources.

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4. RESULTS: WATER RESOURCE AND ENVIRONMENTAL STATUS

A project survey identified that over 90% of Neiafu was operating failing sanitation systems. A further small percentage had no access to improved sanitation. Through the project, it has been possible to pilot the rehabilitation of ten failing systems, install two demonstration compost toilets and service the failing systems to ensure access to improved sustainable sanitation. Household level audits currently being developed will enable the Neiafu communities to ensure that all sanitation systems are functioning sustainably.

Through the rehabilitation of ten failing systems and the 2 composting toilets have the houses have been able to improve their sustainable sanitation. The sanitation systems guide the communities toward alternative ways of how to sustainably protect groundwater resources. In the 2nd quarter, 2013 a household survey was conducted to monitor improvements from the 2010 sanitation audit.

4(a) INDICATOR#1: POPULATION WITH ACCESS TO IMPROVED SUSTAINABLE SANITATION

Prior to the GEF IWMR project, the failing sanitation systems in Neiafu meant that people needed to dig out septic tank sludge and were dealing with leaking and overflowing system. The project aimed to increase access to improved sanitation in Neiafu by 90% (approx. 4500 people). In a hilly community with relatively high rainfall, this also resulted in unsanitary conditions across much of the community. A project Household Survey on sanitation and water supply identified the high sanitation system failure rate, largely attributable to the lack of a pump out system available. Through a combination of establishing a septic pump-out and disposal system, eco-sanitation and household level treatment trials, the project is removing many of the risks associated with failing sanitation systems and also barriers to improving household sanitation. Household level guidelines are being developed in

partnership with communities through this project to raise the awareness of results and aid to uptake. Current monitoring suggest that over 20% of Neiafu systems are now sustainable, and by project completion, should reach the 90% target.

Following the success of the composting toilets coastal communities in particular are now requesting composting toilets. People understand how sanitation systems can help reduce the unsanitary conditions across much of the hilly community.

Figure 21 Composting Toilet at Fungamisi

Annex 6: Awareness Materials Developed and Media Coverage

Annex 7: Participatory Monitoring and Evaluation Plan

Participatory Planning, Monitoring, and Reporting Plan for the GEF Pacific IWRM Demonstration Project Entitled: *"Tonga"*

Improvement and Sustainable Management of Neiafu aquifer Groundwater Resources in Vava'u Islands

1. INTRODUCTION

There are multiple and varied planning, monitoring and reporting requirements as part of the GEF Pacific IWRM Project. These were discussed and agreed during the project's Inception Workshop in September 2009 and were adopted as part of the operation of Tonga's national IWRM demonstration project entitled: "***Improvement and Sustainable Management of Neiafu Aquifer Groundwater Resources in Vava'u Islands***".

Participation and engagement of key project stakeholders including community groups and Non-Governmental Organisations [***Makave, Talau, Kameli, Masilamea, Falaleu, Fungamisi, Neiafutahi, Tongatrust, Neiafu Women Development Group, Vava'u Youth Congress, Vava'u Environmental Protection Association, US Peace Corps***], the project coordinating committee [National Water Resources Committee], national Lead Agency [Ministry of Lands, Survey and Natural Resources], Cabinet, national development partners and global donors in project planning, monitoring, and reporting was considered important in guiding the successful implementation of the project in Tonga.

2. GUIDING PRINCIPLES

The key principles used in developing the project planning, monitoring, and reporting approach were that it should:

- primarily act to better inform an "*IWRM continuum of transition*" in the relevance, effectiveness, efficiency, results, and sustainability of investment in IWRM;
- facilitate good governance of demonstration project activities, including areas of project finances, coordination, planning, capture of lessons learned, and technical quality assurance;
- ensure efficient and cost-effective compliance of reporting requirements of the National Government of [Tonga], SPC/SOPAC, UNDP, UNEP, and the GEF;
- ensure relevance of the information and data collected, and that data on project results can be rolled up and down, from "*Community to Cabinet*" and from "*Country to Global Donor*"; and
- Draw on participatory Most Significant Change (MSC) techniques which act to monitoring and validate reported project impacts on behaviour.

3. PLANNING, MONITORING, AND REPORTING FRAMEWORK

The general planning, monitoring, and reporting framework developed for operation through the [Tonga] national IWRM demonstration project is summarised in Table 1. The timetable of activities is summarised in Table 1.

STEP 1

Project Planning
Insert a brief overview of how you engage Community Groups, your National Coordinating Committee, and Lead Agency in annual and quarterly planning of demonstration activities. Including the planning of your project's finances, activities, use of lessons learned or examples of best practice generated through your project.

Quarterly planning are always put into steering committee meeting in which almost Community Groups are engage there through their Town Officer' as representatives and planning are then discuss and endorse by committee. Lead Agency also the Project Focal Point are aware of everything that project plan and is fully engage with the Project Management Unit in reviewing planning and endorsement.

Since Project Manager always attend whenever National Water Resources Committee are met, she present all planning that the project has planned either quarterly or annually. GEF-IWRM Project also funded meeting with National Water Resources Committee once in which aiming to fully engage them in everything this project is planned.
Well engaging with Community Groups, Lead Agency, and National Committee provide wider knowledge once brought a topic through this trend of authority.

STEP 2

Project Monitoring
Insert a brief overview of how you engage Community Groups, your National Coordinating Committee, and Lead Agency in monitoring of your demonstration project activities and results. This should include a description of how you involve your stakeholders in the monitoring of project expenditures and budget, as well as reviewing the results of project on a quarterly and annual basis.

Community of the demonstration area are represented by their town officer to the Project Steering Committee, and that will be the consistent engagement is made with all the community is through their town officer. Arrangement of consultation workshop with the community is depending on issues/activities arises but normally we schedule an average consultation meeting with the community twice a year. Project Manager always makes advantage to attend whenever National Water Resources Committee is met in which she will be questioning and engage with them in national level. Lead Agency is the same Organisation in which Tonga Demonstration Project is under, therefore they are well updated and engage with the demonstration Project in almost all schedule and planning of this project. Stakeholders are met quarterly and they are well informing of quarterly expenditures in figures and budget too. Lead Agency is fully aware of the expenditures and budgeting as they are always through the CEO for approval and endorsement. It is well inform in every meeting either national or local that Project activities has to be approve and amend by committee according to their view in monitoring the project, but will be of the same tract as project goal was initially set for.

STEP 3

Project Reporting
Insert a brief overview of how you engage Community Groups, your National Coordinating Committee, and Lead Agency in reporting of your demonstration project activities and results.

In addition to the preparation of your project's routine quarterly and annual reports, this should also include a description of the mechanisms you have established to keep your stakeholders informed of project issues and results on a regular basis, e.g., community meetings, newsletter, use of print/TV media, Cabinet/Congress briefings.

Since Steering Committee is the first body of engagement to Community Groups, reporting process is so weak at that point. Mostly the only time of reporting made to them is once quarterly during steering committee meeting, line of Communication is weak between here as report seems not well flow. For Lead Agency, line of Communication is went well and reporting is flow well and fast, this is due to the fully participation made by the Lead Agency and is of good position in contact with PMU.

As was mention above, it is clear at the moment that the reporting mechanism is slow where demonstration has not set any permanent communication procedure and basis in which stakeholders, community groups expect to aware of planning, report from the project activities and result. Except from meetings and media, Project Management Unit has brought this communication line into their attention several times during meeting; still it wasn't properly arrange and practicing.

Table 1 Draft Participatory Project Planning, Monitoring, and Reporting Plan

Year	2010				2011				2012				2013			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Community Groups [Makave, Talau Kameli Masilamea, Falaleu, Fungamisi, Neiafutahi]																
Participation in regular review of project outputs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inputs to preparation of quarterly work plans and budget	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Reflective review of project outcomes - workshops			X				X				X				X	
Annual review and inputs to lessons learned							X				X				X	
Annual review and planning of use of traditional knowledge/governance in project planning							X				X				X	
Storyboarding and structured video interview approach to identify Most Significant Change at community level					WWD 22/3		X		WWD 22/3		X		WWD 22/3		X	
National Coordinating Committee [National Water Resources Committee]																
Quarterly inputs to progress, financial, and lessons learned reports prepared by PMU/community groups	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Quarterly review/endorsement of work plans and budget	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Identification of quarterly needs for technical supports and preparation of recommendations based on known benefits and costs of options	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Annual review of replication and scaling-up plans							X				X				X	
Annual review of quarterly reports and preparation of advice/guidance for community groups			X				X				X				X	
Annual endorsement of Project Implementation Review and preparation of advice for Cabinet/Congress		X				X				X				X		
Lead Agency [Ministry of Lands, Survey and Natural Resources]																
Ongoing Oversight of Project Management Unit Staff																
Ongoing review of procurement and reporting to ensure compliance with fiduciary standards of MoA parties																
Quarterly review and signature of progress and financial reports for submission to SPC/SOPAC RCU	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Submission of annual PIR and annual summary of community workshop(s) to Cabinet			X				X				X				X	
Development Partners (UNDP and UNEP)																
Review and feedback on annual PIR reports			X				X				X				X	
Submission of annual project results to global database			X				X				X				X	
Preparation of materials for global sharing of results							X				X				X	
Support to production of project experience notes and reports on results in global water for a (e.g. IWC6&7)								X IWC6								X IWC7

Lesson	Audience	Scale	Applicability of Lesson	Replication Tool(s)	Time Frames	Cost
Stakeholder Engagement						
Obtaining community acceptance of improving septic leakages, utilize sand filter system and composting toilet	National Water Resource Committee National Government Agencies Project Managers (NGOs, national and regional)	Island	Generally instructive to engaging community support for initiatives that are not universally popular Specifically applicable to initiatives looking to introduce composting toilets Key Areas: Community engagement Influencing communities Sanitation Water Use Efficiency	National government agencies: - twinning visits - resource package - GEF IWRM internet - conference/RSC presentations National agencies - APEX body discussions and presentations - resource package - direct engagement Project Managers - resource package - regional project reporting - conference presentation(s)	Q2 - Q4,2011 Q2,2012	Negligible – hosting $2,000 Negligible Negligible – covered already
Project Management						
Extending water management to the rural villages	Tonga Government Agencies Project Managers (NGOs/ national) Regional / Donor project managers	Island/ National	Generally instructive to facilitating smooth project inception and ongoing management	National agencies and project managers - report(s) - APEX body discussions and presentations National government agencies: - twinning visits - report(s) - RSC Regional / Donor Project Managers - report(s) - RSC - Agency meetings		
Capacity/Performance						
Increase the capacity of the Project Management Office with more staffs	Tonga Government Agencies Project Managers (NGOs/national)	Island/National	Recruit Office administrator and field assistants	Advertise the vacancy post through government procedures- endorse and recruit by lead agency and project manager		
Coordination/Integration						
Use the existing Neiafu Steering Committee with an relevant additional members from all villages	Tonga Government	Island/National		Endorsement by the Existing Steering Committee		
Technical						
Replicate the existing technical systems	Tonga government National government agencies	Island/National				

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
1. Monitoring the effectiveness of stress reduction measures and management models of the IWRM/ IWCM Project to inform scaling up and donor investment in ICM	1.1 Improved data collection for monitoring effectiveness of improved sanitation systems for environmental stress reduction	Extent and continuity of the data collected through PM&E Plan	Lack of operational PM&E Plan for improved sanitation systems in Vava'u	PM&E plan developed and operational for the eco-sanitation compost toilets, sewage lagoons and improved septic systems featuring measures for quantifying inter alia nutrient loads in surrounding environment, effluent quality and pathogen survival in compost	Published PM&E plan, monitoring results, annual implementation reports, analysis and research reports, comparative studies, online database	Available resources to undertake PM&E Consistent methods applied for data collection
	1.2 Enhanced knowledge base for decision making by agencies and communities on appropriate sanitation treatment systems in low-lying island setting	Status of the database and number of dataset therein	Lack of centralised and reliable data on efficacy of sanitation options	Database of existing and new information regarding the effectiveness of different sanitation treatment options and potential impacts on the environment collated and made available online and publicly	Online and hardcopy database available	Data exists and is obtained from reliable sources
	1.3 Evidence based scaling up of eco-sanitation through optimal design and operation of systems to meet international standards for water safety and use of human compost in Tonga	Extent of uptake of the scientific recommendations for improving eco-sanitation system designs to optimise pathogen inactivation, nutrient reduction and compost suitability	Limited understanding of efficacy of eco-sanitation systems at reducing contaminants on Vava'u including dominant mechanisms, contaminant reductions and associated operating conditions	Locally appropriate design and management of eco-sanitation systems developed through targeted scientific research into composting mechanisms, contaminant reductions and optimal operating conditions to enhance system efficacy	Documents of assessments and monitoring results, analysis and research reports, comparative studies and consultation meeting reports Improved design and construction plans Published scientific paper [Yr 3}	Design and operation of eco-sanitation systems are able to be optimally improved Resources are sufficiently available for reliable analysis of eco-sanitation systems to produce robust scientific results Cost of refined design does not exceed ability to pay

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
2. Scaling up and donor investment of stress reduction measures and approaches for coordination and management models through local and national capacity building	2.1 Sustainable sources of funding available for community maintenance of improved sanitation systems	Extent and continuity of participation at CSMF meetings	Maintenance is at the expense of the householder and largely out of reach	Cross-sectoral Community Sanitation Maintenance Fund (CSMF) established and functional; financing options identified featuring procedures for appropriate and timely accessing of funds	CSMF ToR, meeting documents and participation lists	Improved sanitation systems are worthwhile investments
		Number of financing options identified and status of their availability			Sustainable financing report, agreements and plans	Willingness of community and agencies to participate in CSMF
					Maintenance Fund procedures	
	2.2 Community capacity for accessing donor funds strengthened through innovative awareness and training	Percent increase in target population with applied understanding of donor investment procedures	Limited community understanding of donor proposal procedure leading to un-accessed funds	Proportion of target community members with awareness of and technical skills to successfully plan and manage local waste management initiatives increased by 30% through innovative participatory techniques	Consultation meeting and activity reports, training workshop outputs, participatory interviews	Awareness and capacity building materials are sufficiently well designed to engage community members and resource users
		Number of community-led donor projects submitted			Community-led donor proposal documents	Continuity of participation of target audience in awareness raising events
	2.3 Strengthened national replication of IWCM/IWRM coordination and management planning model	Number of GEF Small Grants Programme, and international donor projects implemented to support the replication of the IWRCM/IWRM model and implementation of management activities	Limited access to donor funds for developing catchment management plans and implementing catchment management activities	Partnerships with GEF Small Grants Programme and international donors to strengthen capacity for replication of the IWCM/IWRM model nationally and implementation of management activities locally	GEF Small Grants Programme and international donor project proposals and implementation reports	Suitable community based organisations to assist communities with donor project requirements
	2.4 Environmental and public health safeguarded via targeted reductions in nutrient and pathogen contamination at three priority coastal sites in Tonga	Volume reduction in untreated effluent discharged directly to the environment	Most effluent from current household sanitation systems is discharged without treatment to the receiving environment	Nutrient and pathogen loads from effluent discharging directly into the receiving environment reduced by 10% through replication of improved sanitation systems at three priority sites in Tonga	Consultation meeting documents, site selection and construction documents,	Design and operation of sanitation systems is effective in reducing untreated effluent entering the environment
					Report on assessment and operational status of systems [Yr 3]	Adopted procedures for waste management and composting result in desired reductions of contaminants

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
3. Establishing Coastal Zone Managements Plans via identification of critical fisheries habitats and coastal areas at three priority sites in Tonga	3.1 Strengthened information base for planning, monitoring and evaluation of priority coastal management areas in Tonga	Status of data collection programmes for 3 priority sites and uptake of recommendations	Little data is available on the status of near shore fisheries habitats	Fisheries and habitat data collection programme operational to identify critical areas of fisheries habitats at 3 priority sites in Tonga	Monitoring results, analysis and research reports, comparative studies and final evaluation report [Yr 3] Tonga Fisheries Habitats document [Yr3]	Consistent use of standardised data collection methods and procedures
	3.2 Enhanced knowledge of linkage between land based pollutants and the status of coastal fisheries habitats	Status of data collection programmes for 3 priority sites Degree to which scientific evidence demonstrates linkages to coastal ecological health	Little data available on coastal habitats, links between land-based contaminants and coastal water degradation and coastal habitat status	Ecosystem processes and coastal health data collection programmes operational to identify nutrient dynamics, threats from land-based contaminants to coastal waters and impacts on fisheries habitats at 3 priority sites in Tonga	Monitoring results, analysis and research reports, comparative studies and final evaluation report [Yr 3] Coastal Health Summary for Policy & Planning [Yr 3]	Untreated effluent disposal is negatively affecting coastal water quality Resources are sufficiently available for reliable analysis and evaluation of contaminant dynamics to produce scientific results
	3.3 Strengthened cross-sectoral coordination in the planning of coastal and fisheries management areas to support sustainable use of in shore fisheries in Tonga	Continuity of government agency participation in NHLC meetings Status of management plans	Lack of cross-sectoral involvement in management of critical coastal areas and fisheries habitats	National Coastal Health Committee (NHLC) established and functional to oversee the development of coastal and fisheries management plans	NCLC terms of reference, membership lists and meeting reports, joint planning and management decisions	Willingness of environment, fisheries and public health sectors to engage in joint decision making and planning


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