



# GEF Pacific IWRM Demonstration Project

## Integrated Sustainable Wastewater Management (EcoSan) for Tuvalu



Tuvalu

Final Report

Funafuti, Tuvalu

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## PREFACE

The Pacific nation of Tuvalu sits north of Fiji and is made of eight small coral islands, with a population of almost 12,000. The capital island of Funafuti has about 40% of the inhabitants with over 4,000 and is the main focus of this project. Funafuti faces two main environmental challenges; water shortages and wastewater pollution, ultimately impacting on human health and the coral lagoon. Both of these issues can be effectively addressed by the adoption of eco-sanitation as the preferred form of human waste sanitation management.

All water used on Funafuti is harvested from rain. Most water on the outer islands is collected this way however there is more use of groundwater; in most of the outer islands the available groundwater and its quality is largely unknown, on Funafuti it is polluted and brackish beyond human use. Issues of water shortages are increasing annually with increasing populations and erratic weather and rainfall patterns. The Government of Japan subsidises a Desalination plant which can produce a maximum of 32000 gallons of fresh water in 24 hours. The government of Tuvalu has a storage capacity of 616,313,14gallons of water and the communities have a storage capacity of 2,038,846 gallons of water. Most water is collected domestically with all households being provided 10,000 litre water tanks under both EU and AusAID water harvesting projects. Some households however still struggle with maintaining water harvesting equipment (roofs/gutters etc) and lack water conservation skills and/or tools. Many suffer due to large number of family residing under a small roof catchment. During dry spells, the desalination plant struggles to provide sufficient water for the population and long waiting lists ensure that some families go without water for days.

This issue is compounded by the use of flush toilets that are estimated to use 30% of household harvested water. During dry periods some families chose not to use the flush toilet and open defecation is common. This has server health implication to the community.

When flush toilets are used, insufficient soil quality (organic and fines proportions), depth to groundwater and area for irrigation in Tuvalu mean that septic tanks cannot function as they are designed. There is insufficient area for adequate effluent distribution and runoff is not correctly treated before seeping to groundwater. A septic tank audit of Funafuti in 2001 (AusAID 2001) identified that 96% of septic tanks on the island were not suitably constructed. To further compound this issue, there are no septic tank pumps to desludge the septics, nor an operational sludge treatment plant on Funafuti. As such, poorly treated wastewater is discharged to groundwater and excess sludge is simply removed to pits dug beside the septic tank. This practice is a major human health and environmental hazard.

It is intended that Tuvalu address the above issues by increasing water storage capacity alongside improvements in catchment management and water use efficiency. Many of these issues need to be addressed at a community and household level.

The Tuvalu National Sustainable Water and Sanitation Policy was written through the support of the IWRM Project in association with the PACC Project. This policy was endorsed in October of 2013 and puts IWRM principles at the core of the Tuvalu water sector. There has also been measures taken to increase the capacity and strength of the water sector for both water and sanitation management. Most importantly, it is intended that through demonstration and popular uptake, composting toilets (now known locally as Falevatie) become the preferred form of sanitation nationally

A challenge that faced the IWRM Tuvalu project was gaining an improved understanding and awareness within the government of the benefits of composting toilets and the limitations and human health/environmental impacts (as well as economic) of continuing with current sanitation practice and building more water storage. This has been achieved as now eco-sanitation systems are enshrined in the Water Policy.





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

Many reports and reviews have recommended in the past there is an urgent need to revise, update and implement the draft Water Resources and Sanitation Management Bill, the draft Integrated Water Resources Management Plan, and the Tuvalu National Building Code which provides regulations and guidelines for design of roof catchments, rain storages, and sanitation systems. Among other benefits, this institutional support will strengthen the authority of the Water and Sanitation Committee and will assist in clarifying roles and responsibilities within and between organisations and provide a framework for long term planning for staff requirements and funding. The reasons that this institutional support has not happened until now need to be analysed, understood and addressed.

There is a need to refurbish or supplement fresh water resources by repairing rainwater harvesting systems, increasing household and community rainwater storage and investigating and expanding the use of groundwater resources.

It is important to ensure that there are enough personnel to attend to water and sanitation requirements within organisations that are responsible for managing the water sector. There is also a need to strengthen the capacity of these organisations including the Public

Works Department, Meteorology Department, the Waste Management Unit, the Kaupule and Public Health Division of the Ministry of Health.

Most households also rely on individual or communal rainwater tanks so water management is largely in the hands of the community. Awareness raising activities are conducted by government, NGOs and community based organisations in relation to water resources and sanitation management, usually in association with donor funded programmes. However there appears to be limited understanding of the linkages between poor sanitation, disease, degradation of the marine and aquifer environment and the indirect and direct impacts on livelihood and food security. The need to reduce demand and conserve water is also not widely appreciated, and complex cultural and land tenure conditions limit the opportunity for intervention by government. Practical training will not only raise awareness but will also provide households with the necessary skills to take action and responsibility.

Dry spells are defined as 15 consecutive days with less than 0.1mm rain per day. A short record (1971-85) indicates that on average between one and ten dry spells can be expected every decade as shown in the table below. About two-thirds of such spells occur during the drier season, i.e. May to October, and are more likely in the northern islands.

Professional Training Needed	Community Training Needed
Water resources assessment (groundwater and rainwater), monitoring and analysis	Demand management including use of water saving devices, leakage control and adaptation to climate variability
Integrated planning including reference to climate variability and drought planning	Design, construction and maintenance of rainwater harvesting systems
Cost recovery and demand management	Design, construction and maintenance of effective and appropriate waterborne sanitation systems
Training for plumbers and other relevant personnel on design and maintenance of rainwater harvesting systems, and design and construction of septic tank toilets and waterless zero-discharge toilets	Design construction and maintenance of waterless sanitation zero discharge systems (including method of treatment, advantages and disadvantages, cost)
Community liaison	Water quality monitoring and protection including use of filters and first flush mechanisms
	Training in hygienic construction and maintenance of wells should also be provided to households in relevant locations. Training should draw on traditional understanding of groundwater management

Island	Rainfall Record	Mean Annual Rainfall (mm)
Nanumea	1947-84	2 891
Nanumaga	1947-84	799
Niutao	1955-84	2 737
Nui	1941-84	3 245
Vaitupu	1948-84	3 117
Nukufetau	1955-84	2 831
Funafuti	1941-84	3 498
Nukulaelae	1953-84	3 291
Niulakita	1945-84	3 478

Rainfall and rainwater harvesting is the primary source of water supply in Tuvalu but this was not always the case, groundwater was mostly utilised until the introduction of wester technologies.

In the early 1980s most families took advantage of an aid project for provision of ferro-cement storage tanks attached to small areas of roofing sheets providing the catchment and shelter for an external kitchen area. The tanks had an approximate capacity of 3.6 m<sup>3</sup> and were intended only to meet drinking water demands. However once supplied, usage increased and the available water quickly depleted. A contributory factor was the limited catchments supplying the tank at 9 -12 sq. m. The adjacent house at that time normally had a traditional roof of pandanus thatch and the run off was (and still is) not acceptable for personal use.

Groundwater is available on all islands, but the extent and quality are mainly dependent on factors such as size of the island, type of soil and its permeability, amount of infiltrated rainwater, and density of seawater. The table below summarises estimated groundwater in Tuvalu.

Island	Islet	Location	Estimated Groundwater Area (km <sup>2</sup> )
Nanumea	Main Village		0.10
		Matagi	0.63
	Lakena	Majority	0.53
Nanumaga		Majority	0.90
Niutao		Eastern half	0.81
Nui	Fenau	Limited	0.08
	Meang	Central	0.15
Vaitupu		Northern	0.94
		Motufua	0.34
Nukufetau		Fale	0.21
		Fagaua	0.03
Nukulaelae	Fenualago	Central	0.02
	Tefakai	Northern	0.02
Niulakita		Western half	0.15
Total			4.9

It has to be stressed that comprehensive groundwater assessments is required. An immediate indicator is the presence of existing wells and pulaka pits which have been tested in the past. The groundwater that is available feeds the natural vegetation and crops grown in the pulaka pits and elsewhere. Abstraction for human and other uses varies from island to island and no accurate figures are available. The water is used for livestock, washing clothes and bathing, and has been used for drinking during drought.

On many of the islands groundwater is available under the villages, which is probably why the villages were originally settled in that location. However because of the extensive use of pit latrines and septic tanks the water is contaminated and its use can lead to disease. Groundwater can be polluted from livestock waste and indiscriminate dumping of refuse and particularly chemical wastes such as medical, batteries, oils and fertilisers. Since areas of groundwater have been identified, it has been recommended that refuse disposal has to be restricted to those areas which will not affect groundwater supplies. Similarly the roaming of livestock should be controlled as should the use of agricultural chemicals.

Desalination was intended originally for emergency use only it is now used as a main water supply especially on Funafuti. It is a very expensive way to acquire freshwater, so the Integrated Water Resources Management (IWRM) Plan aims to identify cheaper ways to meet public demand with minimal dependence on desalinated water. The plant on Funafuti produces water at a unit cost of AU\$3.50 per m<sup>3</sup>. The existing tariff used in Funafuti recovers less than half of the ongoing operation and maintenance costs. The Public Works Department (PWD) considers these costs unsustainable as it is not possible to recover any capital investment costs for replacement of the plant. On Funafuti the seawater is extracted from the lagoon and it has been reported that its quality is dubious due to its closeness to the village.

When considering vulnerability; the natural disasters that can affect Tuvalu include cyclones (not common but highly destructive when they do occur) and drought, both of which could be exacerbated by climate variability and change and sea-level rise. Climate models are not yet able to state with any certainty what changes in variability and extremes may occur.



Human activities/practices also contribute to vulnerability to disaster most notably in water supply and waste management practises: 1, Due to high rainfall water supply is usually adequate but quickly becomes an issue during dry spells. Insufficient capacity and storage and poor construction and maintenance of rainwater harvesting systems means that supply is depleted in dry spells of one or two weeks. The community then relies on the government tanker to transport water from the national reserves. And 2, Poorly controlled waste disposal is still commonplace throughout Tuvalu. Inadequate disposal management methods associated with land use is common on Funafuti, including dumping of chemicals and used oil. Pollution of groundwater and marine waters from inappropriate sanitation systems and animal waste (especially pigs) is a serious threat. These practices are contributing to deteriorating public health and environmental degradation. On Funafuti groundwater is no longer a viable secondary source for human use, and groundwater is being similarly threatened in the outer islands.

Tuvalu has a disaster management plan which recommends actions to be taken by the government in the case of natural disaster such as drought and during a major fire. Desalination and distribution of water from reserves are listed options. Tuvalu has a water acquisition provision in the Constitution which gives the government and the Kaupule the right to acquire all available freshwater during drought and distribute equitably to all the community. The plan does not provide any guidance to secure freshwater resources during more physically destructive disasters such as hurricanes, cyclones or storm surges and tidal waves.

#### Measures to manage impacts and concerns (IWRM approaches)

Reviews and studies over the last decade have made many recommendations to reduce vulnerability to climate variability. In the Pacific Vulnerability and Adaptation Background Paper it was noted by White (2005) that the following aspects of previous studies raised concerns as follows:

- The failure to formalise the draft Water Resources and Sanitation Management Bill and the draft Tuvalu Water and Sanitation Plan to provide the necessary institutional support.
- Limited knowledge of water resources, demand and storage particularly in outer islands.
- The fact that the demand for delivered (government) water starts directly after a week of no rain.

The report goes on to conclude that together these mean that Tuvalu is extremely vulnerable to climate variability and that adaptation is currently difficult. The priorities for the water sector in Tuvalu stemming from the concerns are:

- Establish a sound institutional basis for the management of water and sanitation (policy, regulations, incentives, plans, organisational reform and responsibilities).
- Increase capacity to manage water and sanitation and predict water related extreme events (household and community).
- Improve knowledge of available water resources, demand and prediction of extreme events.
- Improve water conservation and demand management strategies.
- Increase household and communal rainwater storage.
- Increase the use of groundwater.
- Improve sanitation systems



The SOPAC study recommended that if the rainwater supply systems in Tuvalu are to have any kind of consistent reliability several key points should be addressed.

- Roofs, gutters and storage tanks need to be properly maintained.
- Water conservation practices should be encouraged.
- Roof areas with guttering need to be maximised.
- Rationing schedules need to be developed and followed by users during periods of drought.
- The design standards for roof catchments need to be amended.

The majority of the toilets are sited outside the house and are usually pour flush latrines which may be a pit, lined with coral stone, sealed with a concrete slab on which is installed a toilet seat. Flushing is manual and inefficient due to the design of the pan and its seal.

It has been observed by government personnel that toilets are not used as frequently as expected. Even with the additional rainwater storage now being provided there are times when the use of water for flushing has to be limited. In addition, particularly on outer islands, toilet paper has not always been available and/or affordable and this has led to disuse of flush toilets. There is a prejudice in Tuvalu that toilets are only for the weak, sick or old, and so usage is restricted further. Consequently even if a household has a toilet, some family members will still use the beach.

There are no active measures in place to prevent pollution from poorly managed wastewater treatment and/or discharges. The National Building Code has been accepted in principle but not endorsed and implemented.

When looking at the issues of water supply and sanitation together the impact of water scarcity becomes obvious. Lal (2006) reports that during periods of water shortage, the waterborne systems toilets cannot be used, and 80-90% of the households surveyed use lagoon and ocean side beaches for defecation purposes. Thus water scarcity not only affects potable water supply but also affects non-potable water usage including specifically its use in sanitation and therefore results in increased social, environmental and economic costs to the country. Two domestic composting toilets have been trialled in Tuvalu, one installed in 2006 and one in 2001, both of which are functioning well and accepted by the host families. There is an opportunity to build on the work undertaken during the International Waters Programme and further promote the links between ecological sanitation and adequate water supply.

#### **Introducing an integrated approach to barrier removal**

There is a need to refurbish or supplement freshwater resources by repairing rainwater harvesting systems, increasing household and community rainwater storage and investigating and expanding the use

of groundwater resources. However there is also a need for demand management. Improvements and innovations in the management of wastewater could contribute to the protection of water supply and reduce pollution and degradation of land, groundwater and marine environments. To achieve this, collaboration of all stakeholders will be required: government institutions, non-government and community-based organisations and in particular householders themselves.

The technical improvements that are required include the repair and/or re-design of existing waterborne systems and the trial of waterless zero discharge sanitation systems in the homes of a broad cross-section of the community. These improvements and innovations in the management of wastewater would contribute to protecting water supply as follows:

- Reduction of demand on primary water supply (rainwater harvesting) for flushing of waterborne sanitation systems.
- Reduction of dependence on national reserves to supplement household supply by reducing the need to flush waterborne systems (could reduce demand by 25 - 40%).
- Protection of secondary source of water (groundwater) from pollution by inappropriate sanitation technology.
- Protection of groundwater for use as a viable secondary source of water during drought, thus reducing vulnerability to climate variability.

Development and implementation of improved and coordinated water resources and wastewater management through cooperation of civil society and government. Source control of pollutants which impact on land, groundwater and marine environments will also be achieved through improvements in wastewater management as follows:

- Reduction of ingress of sewage to groundwater, lagoon and fringing reefs, and protection of marine habitat, and fish stocks and food security.
- Reduction of diffuse pollution of soil around malfunctioning and surcharging septic tanks and pour flush latrines, and protection of public health.
- Provision of organic fertiliser, and renewable energy, from alternative treatment of human and animal manure.
- Practical demonstration of the links between water conservation, effective waste management, public and environmental health, and food security.

These community-based activities in wastewater management will provide tangible economic and social benefits to households, and this is the most effective form of education. There will also be flow-on benefits such as enhanced potential for income generation through eco-tourism, dive tourism and marine recreation which in turn will raise the value of conservation and pollution control in the eyes of the community.



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

The IWRM Tuvalu project sits within the Water sector of the Public Works Department. The Public Works Department (lead agency) falls under the Ministry of Public Utilities and Industries and is responsible for:

- o Providing water as and when needed
- o All water and sanitation issues arising in Government Houses and Buildings.
- o Implementing water or sanitation related projects (some)
- o Water disaster management planning
- o Sludge management of all homes (when requested by homeowners)
- o Water and Sanitation Planning (with ministry)
- o Building code (recommendations only - enforcement by Kaupule)
- o Governed by Ministry policies

Aside from Water Catchment projects, operations of the Water sector are limited. The IWRM Tuvalu project has had a huge impact on the water sector and is increasing its strength through the below mentioned documents. IWRM has supported the operation of two other water projects which are managed by the water sector: Water Catchment Project and Water Tank distribution, and the supportive relationship has ensured support and respect for the IWRM Tuvalu project within

the department. Some informal training has been given to Water Sector staff in construction and maintenance of Falevatie highlighting their importance and with emphasis on their role as the countries preferred form of sanitation. Training has extended beyond the Water Sector to other lead agency (Public Works) departments.

IWRM has also successfully supported the government of Tuvalu and the National Disaster Committee through periods of drought and National State of Emergency, assisting in emergency planning and logistical distribution of water.

The Water Sector and Public Works Department are represented on the National Water and Sanitation Steering Committee. Further outputs of IWRM Tuvalu are to work with the Water Sector and lead agency (Public Works Department) towards Water and Sanitation Planning (as outlined in Tuvalu's ten year water plan) and water related section of the National Building Code as covered by both the Water Act and Water Policy. All these documents will be produced by IWRM Tuvalu in collaboration with the Water Sector and other partners.

Policies Endorsed:

- o National Sustainable and Integrated Water and Sanitation Policy (2013)
- o Policies in draft:
- o Water Act
- o Operational business plans

**Lead Agency:** Ministry of Public Utilities , Public Works Department

**Memorandum of Agreement Signed 10th July 2009 by:** Paulson Panapa on behalf of the Ministry of Waterworks and Energy and Marc Wilson, IWRM Regional Project Manager, on behalf of SOPAC



**National IWRM Focal Point**

\*Previous IWRM Focal Point was Olioliga Iosua who was engaged in this role from 2011-2013. At time of writing this position was vacant.

**National IWRM Project Manager**

Mr Pisi Seleganiu  
IWRM, Water Sector, PWD,



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

Before the IWRM Tuvalu project began, there was a National Water and Sanitation Steering Committee (NWSSC) which was founded by the International Waters Programme (IWP) project and although some work had been done by the committee since on the SOPAC Diagnostic report; the committee has been mostly inactive following the end of IWP.

The original NWSSC, under IWP, was responsible for supporting the IWP project in developing its cost benefit analysis of sanitation management in Tuvalu and other documentation. As the project steering committee the NWSSC acted as a governing body.

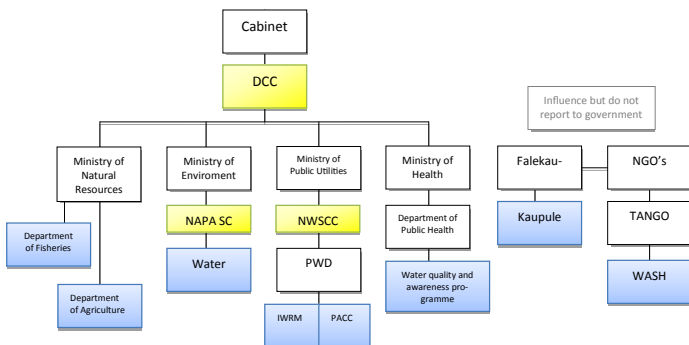
The same NWSSC was revived under the IWRM project on the 17th of December 2009. It is also the steering committee of the PACC Tuvalu project and meetings are shared. Some original committee members have moved on and the IWRM project saw fit to invite additional members, such as community and women group representatives – however the core group of the committee is the same. Many members

of the NWSSC also sit of the Disaster Management committee and Water Planning committee (established for EDF10 management).

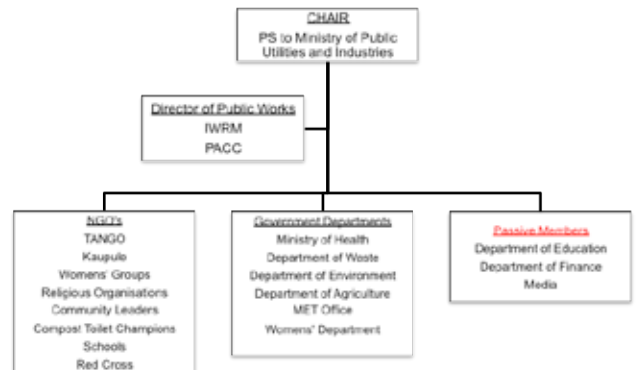
To date, the committee continues to be considerably inactive outside of meetings. Some committee members have been engaged through communication committees and have been active in supporting community engagement activities such as World Water Day week. There are plans to engage the NWSSC further in introducing National Indicators and Regional Framework. They will also be engaged with National Water Plan, Water Policy/Act and Water related area of the National Building Code.

It is intended that under IWRM, the NWSSC is established as a firm institutional structure and take responsibility for and support the collection of Water and related projects Tuvalu has, ensuring coherence, partnerships and better organisation.

**Current Structure of Water in Sector in Tuvalu**



**Current Structure of the NWSSC**





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

At the beginning of the project, the IWRM Tuvalu team considered together all possible stakeholders and in which way they may impact/be impacted by the project. At the beginning of the project it was a useful exercise in seeing “where we fit” in the community and government etc. It is also good to communicate with team members to find out who knows what about who (especially in small communities); for example someone might have been against eco-sanitation but having a high standing in the community. This opposition to eco-sanitation would only be known on a social level but would be relevant to the project; sharing this information inevitably turned to discussions on tactics on tackling potential opposition and created awareness within the team. As a living document, often stakeholders have been added or their perceived importance lowered/increased over the project term.

The list of stakeholders identified was also shared with the Lead Agency, Focal Point person and former coordinator of the IWP project - who was very insightful (especially in identifying possible opposition to eco-sanitation). The final list was then cross-referenced with the National Water and Sanitation Steering Committee list of participants.

In developing strategies, stakeholders were initially considered in groups and many of the strategies were categorised (ie – “inform by newsletter” or “create partnership”). Since implementation, the intricate details of the strategies have developed as more has become known about the stakeholders and their relationship with the project. Some

strategies for leaders in opposition to eco-sanitation have been to simply have a cup of tea and request an opportunity to discuss the advantages of the project further. Other community strategies have included large island wide Compost Toilet Road Shows and collaboration with National Festivals to raise awareness. Many stakeholders continue to receive quarterly newsletters where partnerships with others, such as the Tuvaluan Association of Non Government Organisations (TANGO) has surpassed expectations and activities, promotions and objectives continue to work together. See Annex 3 for the Stakeholder Analysis and Engagement Assessment.

Stakeholder participation within the IWRM Tuvalu project has focused on community engagement and has included unique activities. As the compost toilets in Tuvalu are designed by Tuvaluans for Tuvaluans, we (the IWRM Tuvalu project) decided that the Tuvaluan community should feel ownership of this new toilet. There is no Tuvaluan word for composting toilet and as such, a communications committee was formed to develop a new word for composting toilets. Falevatie is the new Tuvaluan word for the compost toilets designed and constructed under the IWRM Tuvalu project. It translates as “a toilet which does not use water, is good for the environment and for you”. This new word clearly distinguishes between drop pit toilets and Compost Toilets (Falevatie). Many activities have been used to promote this new term and provide opportunities for stakeholders to discuss issues with the project staff and champions. Activities include; Road Shows, participation in National Environmental



awareness Festivals, hosting World Water Day week long activities, use of media and radio, quarterly newsletters, inter-department meetings and meetings with high impacting stakeholders, committees, competitions, in school workshops, community leader workshops, Falevatie volunteer workshops, meetings with women's and youth groups and workshops held with each island community individually, to name a few. These strategies have unitised ambassadors, champions and in collaboration with experts from other departments/NGO's and has been useful in promoting water conservation and domestic water management methods as well as Falevatie.

A major challenge facing the introduction of composting toilets into Tuvalu was the community's initial reluctance to accept dry sanitation technology as clean and hygienic. In addition to many misconceptions, due to lack of awareness, there is a difficulty in approaching the subject under a local taboo in discussing matters such as human waste disposal. A large hindrance can also be attributed to recent promotions of water seal toilets. In Tuvalu, the move from drop pit toilets (which are unhygienic and cause problems with pollution and sanitation) to flush toilets and septic tanks is recent. This move was initiated by the Tuvalu Department of Health and placed strong emphasis for the need for water for toilets to be hygienic. As such, many consider compost toilets as drop pit toilets and so unhygienic and a step backwards.

Despite this reticence, due to the successful community engagement activities of the project and with the support of its partners, IWRM Tuvalu has seen a huge change in attitudes within the community towards composting toilets. The community response has been overwhelming with an oversubscription of 300% beyond target of households requesting Falevatie prompting additional funding requests and consideration by the government of Tuvalu to construct Falevatie. Tuvalu is quickly turning towards Falevatie as their preferred form of sanitation; this is a direct response to IWRM's community engagement initiatives towards this practical technology.

#### 4.1 Gender Mainstreaming

One of the key lessons learned from Tuvalu IWRM demonstration project was that engaging with women's groups lead to different perspectives on the use of compost toilets. Training in gender mainstreaming and IWRM Tuvalu project was carried out with a range of women's groups on Funafuti and women's delegation from the outer islands. As a result of this training many issues were explored and misunderstandings on the

use of composting toilets or Falevatie were resolved. The Falevatie was strongly recommended, however preference was to ensure the toilets get constructed inside the house (also incorporated in the Water Policy now).

Women groups also had strong objections to use of human compost for agriculture and home gardens. This was resolved through further demonstration through testing of compost and sharing the findings with all stakeholders. It is very important to consider gender and vulnerable groups at the start of any project to ensure a balance perspective on activities being implemented and to ensure appropriate levels of empowerment at the community level.

The provision of sustainable sanitation through the Tuvalu GEF Pacific IWRM is directly increasing the access to improved sanitation for 40 households, about 280 people, with co-funded and catalytic outcomes delivering further increases. These toilets will also alleviate some of the challenges in providing access to improved drinking water sources, significantly reducing household water use, increasing security for women and children and water availability during drought periods.

The engagement strategies have been beneficial at increasing community interest in the project and as more people attended events the more information they had to make informed decisions of their own about the eco-sanitation system. People are now more willing to accept the falevatie into their household, a huge achievement where before people would have nothing to do with them. Strategies have successfully broken down negative public perceptions about the systems through on-going knowledge sharing and inter-community stakeholder meetings and workshops. Personal engagement strategies were particularly beneficial at showing the more private aspects of owning, using and maintaining a falevatie.

To improve stakeholder engagement the Tuvalu IWRM Project will include more separate and specific women's activities as they are a key to project acceptance in the community. It is also important to gain their viewpoints and address their concerns in a safe and supportive environment. To increase engagement of the NWSSC and high level government stakeholders, technical and strategic presentations involving experts in various water related field will be given to increase their participation in IWRM activities. To sustain and improve stakeholder participation in the long term the IWRM project must secure on-going funds from the Government to implement activities.



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

### 5.1 Logframe Development

Due to the initial delay in recruiting staff for the project there was a lag in the start date. The project was late in recruiting staff and so starting. The Logframe was developed in consultation with: the Focal Point Person (Permanent Secretary of Water Works and Energy), representative from SOPAC (David Duncan), AusAID Water and Waste Advisor (Greg Wolff), Project Coordinator (Pisi Seleganiu) and Project Assistant (Catherine Moulogo).

The NWSSC and the IWRM Project Team held a 2-day workshop in early 2013 to revise the scope of the project. Planned activities were reviewed and where activities had not been completed these were discussed and reviewed as to why. Some activities were removed such as the rehabilitation of septic systems because the NWSSC chose to use funds allocated to this activity for the construction of more eco-sanitation toilets, however at this stage funding had been exhausted. 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:	
<b>Component 1</b>	
Suitable national policy and legislation framework to enable better wastewater and water management	
Output 1.1 Consider the revision of national legislation and policy to address gaps and support opportunities for better water and wastewater management	Activity 1.1.1 Identify gaps and opportunities for managing water and wastewater in an IWRM framework Activity 1.1.2 Recommend legislation and policy amendments Activity 1.1.3 Monitor and support recommendations
Output 1.2 Reviewed Draft Water Act and Water Policy to support implementation of wastewater management	Activity 1.2.1 Identify gaps and opportunities for managing water and wastewater in an IWRM framework Activity 1.2.2 Submit Draft Bill to Cabinet Activity 1.2.3 Submit Draft Policy to Cabinet Activity 1.2.4 Follow strategy to support progress to adoption
<b>Component 2</b>	
Sound Governance to provide confidence in the transparency, accountability and credibility of decisions	
Output 2.1 Water and Sanitation Steering Committee reconvened, responsible for delivering the National Water and Sanitation Plan, with public accountability	Activity 2.1.1 Revisit Terms of Reference and Roles and Responsibilities Activity 2.1.2 Reconfirm members of Steering Committee Activity 2.1.3 Establish executive support for Steering Committee
Output 2.2 Water and sanitation roles and responsibilities defined including improvements and changes	Activity 2.2.1 Identify options for improving government agency roles in water and wastewater management. Activity 2.2.2 Define Agency roles and responsibilities
Output 2.3 National government engaged	Activity 2.3.1 National indicator framework established to guide investment and reflect progress Activity 2.3.2 Increased sectoral engagement in formal multilateral communication on water issues by end of project Activity 2.3.3 Increase community engagement with National Government by 50% Activity 2.3.4 Increase community engagement in water related issues
<b>Component 3</b>	
Plans and strategies developed as required to enhance and direct water and wastewater management.	
Output 3.1 Undertake water and sanitation planning as required to increase technical, institutional and stakeholder capacity. Planning undertaken through community engagement.	Activity 3.1.1 Collect and collate existing information, including that available from ongoing studies, into a report to inform water and sanitation planning Activity 3.1.2 Develop a Draft Water and Sanitation Plan, as required, to direct and manage Tuvalu's water resources and wastewater, including vision, strategy and statement of acceptable levels of risk Activity 3.1.3 Consult stakeholders on Draft Water and Sanitation Plan Activity 3.1.4 Deliver Water and Sanitation Plan Activity 3.1.5 Fund Water and Sanitation Plan

Output 3.2 Communication Strategy that facilitates information exchange on key issues, outputs and outcomes to key (including vulnerable) stakeholders	Activity 3.2.1 Develop and implement communication strategy in consultation with stakeholders to enable information exchange between all stakeholders, including periodic reviews of the strategy
	Activity 3.2.2 Complete IWP video and circulate
	Activity 3.2.3 Use media to advertise community consultation and invite households for trial sanitation systems, report, ongoing community feedback on project etc.
	Activity 3.2.4 Record progress of demonstration project on Fongafale and conduct information exchange with selected outer island communities
Output 3.3 Capacity is developed through Capacity Building Strategy to increase stakeholder capacity to a level that enables sustainable water and wastewater management and participation from all sectors across government, non-government organisations and the community	Activity 3.3.1 Identify capacity building needs assessment for stakeholders, governance, technical and institutional needs, identifying long-term needs and priority areas for capacity building
	Activity 3.3.2 Develop capacity building strategy to address capacity needs across all sectors
	Activity 3.3.3 Implement Capacity Building strategy including annual reviews
	Activity 3.3.4 Conduct awareness raising sessions and training as necessary on appropriate sanitation systems for Tuvalu, including the consideration of micro-business opportunities (drafting/building services).
	Activity 3.3.5 Increased national staff across institutions with IWRM knowledge and experience
Output 3.4 Participation Strategy that facilitates stakeholder participation throughout the planning and implementation phases	Activity 3.4.1 Develop participation strategy that facilitates greater stakeholder engagement, including vulnerable stakeholders
	Activity 3.4.2 Implement participation strategy including annual reviews
Output 3.5 Replication Strategy identifying water and wastewater management needs at a national level, identifying mechanisms for transferring learnings and tools and key policy and financial enabling factors, revised to identify lessons and tools as they become available (Methodology)	Activity 3.5.1 Develop replication strategy that facilitates uptake of project learnings at island, national and regional levels
	Activity 3.5.2 Transfer of best practices in water resource protection and conservation to rest of Tuvalu, the Pacific Region and beyond (including annual reviews of learnings)
Output 3.6 National Strategies Implemented	Activity 3.6.1 Develop and implement communication strategy in consultation with stakeholders to enable exchange between all national stakeholders, including periodic reviews of the strategy
	Activity 3.6.2 Mainstream best approaches to IWRM and WUE into national and regional planning frameworks
	Activity 3.6.3 National PM&E plan developed and implemented
	Activity 3.6.4 Increase capacity in national staff in monitoring and PM&E
<b>Component 4</b>	
Review all scientific and other information/data and consider further information needs.	
Output 4.1 Obtain further relevant information as required	Activity 4.1.1 Maintain continuous up to date information on all relevant topics, including but not limited to scientific and social research by National and international NGO's and Government agencies.
Output 4.2 Assess current status of Funafuti sanitation and wastewater impacts	Activity 4.2.1 Update statistics on flush toilets with septic tanks; pour flush latrine and no toilets on Fongafale
	Activity 4.2.2 Update health statistics on waterborne diseases
	Activity 4.2.3 Review available water quality information for Fongafale lagoon
	Activity 4.2.4 Conduct random surveys of attitudes/perceptions regarding different types of toilets and pollution of marine environment
	Activity 4.2.5 Undertake assessment of groundwater resources



<p>Output 4.3</p> <p>Revisit cost benefit analysis report and update where necessary.</p>	Activity 4.3.1 Develop appropriate design of dry sanitation system for Tuvalu based on feedback from current CT users, previous trainees and PWD staff
	Activity 4.3.2 Invite volunteer households to trial composting toilets
	Activity 4.3.3 Construct minimum of 40 composting toilets in cross section of Fongafale households
	Activity 4.3.4 Evaluate project against socio-economic and physical indicators. Refine design of sanitation systems based on user feedback, operational issues and effective treatment
	Activity 4.3.5 Develop costed strategy to replicate preferred option
	Activity 4.3.6 Identify further funding mechanisms for further installations (beyond project capacity)
	Activity 4.3.7 Monitor trial sanitation systems/community response
	Activity 4.3.8 Report on study, including comparing various building materials to reduce cost and demand on coastal aggregate etc, and local aesthetics re design and materials
<p><b>Component 5</b></p> <p><b>Develop tools to aid the management of water and wastewater management</b></p>	
<p>Output 5.1</p> <p>Incorporate regulations guidelines and design of roof catchments, rain storages and sanitation systems in Tuvaluan National Building code.</p>	Activity 5.1.1 Present a submission to cabinet, supported by PWD, to gain support for revising and updating the building code legislation and to incorporate regulations, guidelines and design of roof catchments, rain storages, and sanitation systems in the Tuvalu National Building Code.
	Activity 5.1.2 Produce regulations, guidelines and design of roof catchments, rain storages, and sanitation systems for inclusion into the revised Tuvalu National Building Code.
	Activity 5.1.3 Follow strategy to support progress to adoption
<p>Output 5.2</p> <p>Support development of model and monitoring program to provide reliable information on the status of national rainwater resources (PACC project)</p>	Activity 5.2.1 Support the development of a model and monitoring program to provide reliable information on the status of national rainwater resources
	Activity 5.2.2 Resource and implement monitoring program
<p><b>Component 6</b></p> <p><b>Support all on-ground works to improve water and wastewater management</b></p>	
<p>Output 6.1</p> <p>Support improvements to household rainwater collection and storage to reduce drought stress</p>	Activity 6.1.1 Supporting installation of increased guttering and rainwater tanks to improve the capture and retention of rainwater
<p><b>Component 7</b></p> <p><b>To successfully deliver the Tuvalu Ecosan Demonstration Project</b></p>	
<p>Output 7.1</p> <p>Successfully managed project</p>	Activity 7.1.1 Recruit Project Manager and Project Assistant
	Activity 7.1.2 Establish Project Management Unit office
	Activity 7.1.3 Identify and clarify stakeholders
	Activity 7.1.4 Re-visit project design with stakeholders and refine design and approach where necessary
	Activity 7.1.5 Source additional funding to add value to project outcomes
	Activity 7.1.6 Manage budgets, deliverables and timelines
	Activity 7.1.7 Complete reporting commitments

## 5.2 Priority Areas of Work and Results

The Tuvalu IWRM Project goals are to reduce Tuvalu’s vulnerability to drought and improve human health and the environment through improving wastewater management in an IWRM framework. The objective is to save water and protect human health and the environment through improvement to sanitation systems. The priority areas of work include:

- Develop national policy and legislation considering the suitability of national frameworks to enable better wastewater and water management

- Establishing a national coordinating APEX body
- Review scientific data and consider further information needs
- Develop tools such as building code, to aid the management of water and wastewater
- Support the development and implementation of wastewater management systems (eco-sanitation)

The following table highlights some of the key national IWRM results to date. The full Results Notes can be found in Annex 5.

Key Results
1. Successfully engaged the Tuvaluan community, government and politicians in the uptake of compost toilets, to the point where it is now seen nationally as the preferred sanitation option and is included as such in the National Water and Sanitation Policy.
2. Successfully designed and replicated across four project countries a sanitation solution (eco-san) appropriate for SIDS, using local expertise to adapt existing international technologies and community participation to garner support and adaptation. 40 systems installed on Funafuti with planned scaling up leveraged through the EU for a further 135 for Funafuti and outer islands.
3. Establishment of a National Water and Sanitation Policy (2013) that has mainstreamed IWRM water and sanitation solutions and concepts demonstrated through this project.





## 5.2.1 Co-financing

The project has occurred at a time when a variety of different agencies are working to aid Nauru to address critical water and sanitation issues. The table below shows the additional in-kind and cash co-financing raised during the life of the project:

Source	Amount (USD)	Cash or In-kind	Description
Government	70,000	In -kind	Office rental and utilities
EU-SOPAC IWRM	53,692	Cash	Develop Water Policy
Government	700,000		Millennium Development Goals Fund (Outer Island) Financial Agreement has approved and implements early 2014) constructing 5 CT's each outer island.
AusAID	585,000	Cash	Construction and installation of household rainwater tanks
AusAID	415,000	Cash	Implementation of Tuvalu's Water and Sanitation Strategy
Alofa Tuvalu Association	200,000	In-kind	Training centre support
EU-SOPAC HYCOS	50,000	Cash	HYCOS development of the GIS and training
EU-SOPAC Reducing Vulnerabilities	850,000	Cash	Installation of water tanks
Total	2,923,692		

Source	Amount (USD)	Cash or In-kind	Description
European Union	670,800	cash	Replicating the compost toilets at all outer islands with the view for full coverage at Nukulaelae
European Union	268,320	cash	EDF-10 Sanitation component: Up-scaling the compost toilets on Funafuti with a focus on households that have no sanitation facility
SOPAC	27,918	In kind & cash	Provided materials and funding for labour for installation of first flush devices at 100 houses.
Government of Tuvalu	930	Cash	Support the launching of the Water Policy
Total	967,968		



## 5.2.2 Benefits of co-financing

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

### Developing the National Sustainable Water and Sanitation Policy - 2013

**Type:** Co-Financing

**Donor:** European Union (SOPAC-IWRM)

**Amount:** USD53,000

**Main activities:**

1. Hire a local consultant to write a draft water policy
2. Prepare and hold National Water Summit
3. Consultations on each of the outer islands

**Key Benefits:**

1. Engaged community on water and sanitation issues and possible solutions
2. National Sustainable Water and Sanitation Policy was developed and endorsed in 2013, highlighting compost toilets as a preferred sanitation system.



### Replicating compost toilets

**Type:** Additional Funding

**Donor:** European Union (SOPAC-IWRM)

**Amount:** EU700,000

**Main activities:**

1. Replication of compost toilets to outer islands with full coverage expected for Nukulaelae
2. Scaling-up of compost toilets on Funafuti with particular attention to households without any sanitation facilities.

**Key Benefits:**

1. The provision of Composting Toilets will reduce water use, decrease septic pollution and provide much needed sanitation for those without. This will reduce disease and other health risks affiliated with incorrect disposal of waste.
2. It is requested a minimum of five toilets be constructed on each outer islands. With an average of eight people per household this delivers an immediate 400 direct beneficiaries with the entire communities of the outer islands (2400) as secondary beneficiaries through increased water storage and reduced pollution (increasing the health of the human and marine population).





### 5.2.3 Key Awareness Materials

Key awareness materials that were produced during the Tuvalu IWRM Project are presented in Annex 6. These include posters highlighting the sanitation improvement of falevatie, the impact of wastewater entering the marine eco-system. Flyers were produced a part of a campaign to dispel the notion of Falevatie as being a “step backwards”. Discussions through workshops by IWRM showed a common feeling was that the composting toilets were unhygienic and uncivilised. Research by the project staff highlighted that Prince Charles is supportive of Composting toilets. The poster below reads: “This estate has a compost toilet. Who lives in a house like this? Prince Charles, heir to the throne of England”. Following debate surrounding this flyer, the Prince of Wales has been contacted in the hope that he can give his support of the project and Composting Toilets. We are awaiting his reply.

The project produced quarterly newsletters aimed at informing the people of Tuvalu; government officials and vulnerable communities alike. This range of target audience can be seen in the content: the newsletter example is informative, containing information of project activities and contains a marketing approach with a call to action “Falevatie have arrived - Have you got yours”. The newsletters are translated into Tuvaluan and are distributed through three main avenues. Firstly the newsletter is sent to “all staff” reaching all government employees, secondly the newsletter is printed with duplicate copies being sent to all island councils and traditional community leaders (Kaupule and Falekaupule) as well as youth and women’s group leaders. Finally, a large number of copies are left to be read in Cafe’s, craft shops and local stores

The radio was used as a means of reaching the greater public audience. An ad informing people about the falevatie has been regularly aired since 2011. Recordings of the falevatie owner meetings, where owners discuss the experience of having and using a falevatie, were used as part of the local radio shows.

A documentary entitled “Falevatie” was produced by OTV as an educational and awareness raising tool. This documentary highlighted the water and sanitation issues in Tuvlau and the role of the IWRM and falevatie in addressing these. It is available at [www.pacific-iwrm.org](http://www.pacific-iwrm.org)

### 5.3 Catalytic Impacts

The changing attitudes of the Tuvaluan public about the use of eco-sanitation toilets and accepting them as the preferred form of sanitation system would not have happened without the dedicated and innovative activities implemented by the IWRM Project. This is a changing point for the country as now people see the benefits of the falevatie and have adopted the technology as a way to secure the water supply and protect the environment.

The Tuvalu IWRM Project was then successful at catalysing change through the development and construction of falevatie. Funding has been provided by the EU for further construction of eco-sanitation toilets in Funafuti and outer islands, particularly Nukulaelae that is aiming for complete coverage.

The IWRM Project was integral to the development of the National Water Policy through the NWSSC and as the lead implementing group for IWRM in Tuvalu. The success of on-ground implementation of falevatie is reflected in the vision of the National Water Policy stating the eco-sanitation will be the sanitation system of choice in Tuvalu.

### 5.4 Participatory Planning, Monitoring and Evaluation

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 Tuvalu national IWRM demonstration project. Participatory approaches to appraisal, collection of baseline information, planning frameworks and monitoring has been systematic throughout the life of the project. See Annex 7 for the comprehensive participatory monitoring and evaluation framework.

Participation and engagement of key project stakeholders including community groups and Non-Governmental Organisations, the project coordinating committee (NWSSC), national Lead Agency (PUI), Cabinet, national development partners (members of the PSC), and global donors (EU) interests were considered during project planning for the project, including monitoring, evaluation and future reporting.



## 6. Strengthening National Coordination and IWRM Policy and Planning in Tuvalu

### 6.1 Linkages of Demonstration Activities with IWRM Planning

In 2011 leaders and representatives of communities and stakeholder groups gathered in Funafuti to direct Tuvalu's policy response to a range of increasingly serious water and sanitation issues. Close to 100 people assembled for two days at the Nanutasi Fou Falekaupule on Funafuti atoll to participate in a lively but constructive debate on how to best secure Tuvalu's water future. In opening Tuvalu's first Sustainable Water Forum, Minister for Public Utilities Mr Kausea Natano stressed the critical importance of water to the atoll country. "The Forum's theme, Water is Life – Be Responsible, acknowledges the responsibility that we all share for protecting and securing the water and sanitation needed for our children's future" he said. "By working together to address today's serious water issues, we can also strengthen our resilience to natural disasters and climate change."

The timing of Tuvalu's Sustainable Water Forum was significant, as it coincided with the nation's third period of unusually dry weather in as many years. Tuvaluans rely almost exclusively on rainwater collected from the roofs of their homes and government buildings, and in this dry period families are doing all they can to conserve precious supplies. The current situation was particularly difficult on the island of Nukulaelae, where residents are struggling to cope with water rations of around 20 litres per family per day.

While government and the community look to solutions for the serious situation at hand, Forum participants looked to the work needed to secure safe drinking water and sanitation into the future. Particular advice was provided on the development of national water policy to provide a solid foundation for future action. The Forum was jointly supported by SOPAC and SPREP through their programmes for Integrated Water Resources Management (IWRM), Disaster Risk Reduction (DRR) and Pacific Adaptation to Climate Change (PACC). Future development of activities such as producing Building Code up date will involve gender sensitive community consultations and workshops. Monitoring and evaluation will continue to be carried out by the NWSSC.

To summarise the direct links between IWRM demonstration project and IWRM planning, the Pacific IWRM demonstration project has contributed to the National IWRM planning process by:

- Raising public awareness on linkages between sanitation practices and groundwater pollution.
- Through extensive public awareness and active engagement produced transformational change amongst community to acceptance of the compost toilet as preferred sanitation option for Tuvalu
- Actively engaging all major stakeholders within the Project Steering Committee and the Technical/ Communication Working Committee.
- Facilitating the development and implementation of the: National Water, Hygiene and Sanitation Policy framework; National Water and Sanitation Policy.

### 6.2 Improving National Coordination for IWRM

The NWSSC was established in 2009 as the coordinating body for the IWRM Project, overseeing project development and ensuring delivery of activities. Most of the committee members are actively involved in the running of the IWRM particularly the key partners such as Ministry of Health, Department of Fisheries, Department of Agriculture, Department of Women and TANGO. These groups regularly attend meetings and are usually represented by high-level management, i.e. the Director. They are also active outside of meetings in the community engagement strategies. Other partners regularly attend meetings, however their representation is not consistent and often Senior Officers are sent in place of Directors. This causes inconsistencies with the knowledge and understanding of the project that is being shared with these partners. These groups do not participate as fully in activities outside of meetings. In order to strengthen the participation of the more inactive partners greater incentives and linkages should be made to their particular strategic objectives.

Community leaders are always present at meetings and are extremely active in community engagement strategies.



### 6.3 National IWRM Planning

The Sustainable and Integrated Water and Sanitation Policy 2012 – 2021 (WSP) was developed in response to severe drought in 2011 when the government decided to progress its formulation with the assistance of the GEF Pacific IWRM Project. The Policy was developed with input from a wide range of community, government and NGO stakeholders the process of which culminated in a Sustainable Water Forum in 2011. In early 2013 Cabinet endorsed the WSP.

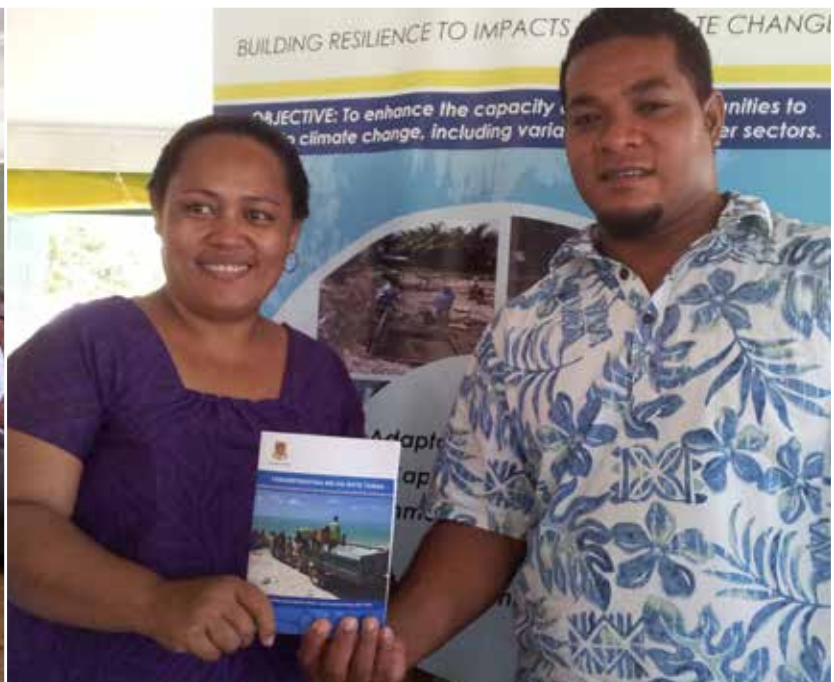
The purpose of the WSP is to ensure that the people of Tuvalu have continued access to safe, reliable, affordable and sustainable water and sanitation facilities. The policy supports Tuvalu's key planning document, Te Kakeega II (National Strategy for Sustainable Development) as well as key regional frameworks such as the Millennium Development Goals, the Pacific Plan and the Pacific regional Action Plan on Sustainable Water Management.

The WSP also compliments other national frameworks including Te Kaniva (National Climate Change Policy), the Strategic National Action Plan (SNAP), National Biodiversity Strategy and Action Plan (NBSAP), the National Action Plan to combat Land Degradation and Drought (NAP), and the National Adaptation Program of Action.

The WSP was developed with a set of guiding principles, consistent with those of the Tuvalu Constitution and other national frameworks, importantly it is owned by the people of Tuvalu. The development of the policy was a bottom up process in which communities in the eight islands were consulted as well as the eight communities in Funafuti.

Currently the National IWRM Plan is in draft from ready for review by the NWSSC. After their review and approval the NWSSC will endorse the plan. The WSP will form the central regulating instrument in the Tuvalu National IWRM Plan. The key elements of the IWRM Plan are:

- o description of current arrangement for national coordination and governance in the water and sanitation sector;
- o statements of overarching strategic policy for the water and sanitation sector;
- o costed priority action plans for Integrated Water Resource Management; and
- o statement of national government and traditional leader support



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

### 7.1 Lessons Learned

Below, ten lessons learned have been highlighted as being of particular value to the development of the project. Five lessons are categorised as negative, five as positive: In the negative category, the activity was unsuccessful in meeting its target aim and so is followed by recommendation for improvement which were highlighted through the evaluation process. Similarly, in the positive category, activities resulted in a positive outcome and were evaluated to highlight the root of their success and provide recommendations for replication.

IWRM Tuvalu project feels that the process of writing Lessons Learnt has as much if not greater importance to the project staff evaluating their activities as potential readers looking to replicate activities. This is due to the nature of reviewing and assessing activities highlighting issues that may otherwise be overlooked.

#### Positive

##### Financial Reporting

- Sending endless scanned copies of receipts and invoices on the internet is time consuming and painful

- Putting all scanned financial information on a Flash Drive and sending it to SOPAC via the Diplomatic Bag has been a big help saving a lot of time and frustration. We recommend all projects do the same.

##### World Water Week 2011

- Community gained understanding and experience of water related issues in Tuvalu and were introduced to Composting Toilets and climate change.

- Good communication with other departments and stakeholders is vital in organising week long events such as this. The support of the schools was greatly appreciated.

- Make sure events are interesting and fun-packed as well as informative.

- Imaginative activities and interesting workshops also helped keep the interest of students and other participants. The light hearted competitive aspect of Primary Challenge especially maintained the interest of families and the community; As well as encouraging the interest of outer island communities.

##### Compost Toilet RoadShow

- The Compost Toilet RoadShow was held to showcase composting toilets to the community. The intention of the RoadShow was to access vulnerable members of the community who are otherwise difficult to

reach.

- Make sure events address community concerns, are interesting and fun-packed as well as informative.

- Showcasing the product is a sales technique often used. In the case of composting toilets many people had negative preconceptions. The angle of the RoadShow was to dispel all negative preconceptions of composting toilets and emphasise the benefits. It is essential the product (pilot compost toilet) is well made and forms a positive impression.

##### Community Awareness Workshop

- Members of the community noted behaviour patterns as being responsible for much pollution (as well as septic tanks).

- Good communication with community is important, allow community to voice opinions and concerns. To increase interest, community could be made aware of issues prior to the workshop through various activities and through radio broadcasts announcing the workshop.

##### Environment Awareness Community Workshop

- Community gained better understanding of environmental and fishing impacts of water issues in Tuvalu

- Collaborate with specialists to give their opinion and scientific support to the project statements. Ensure all facilitators agree on all issues before community discussions take place.

#### Needs Work

##### Poster competition

- Poor response to poster competition

- Chose groups who can easily be contacted and have a controlled setting such as schools. Select and age group who will be interested in the competition, regardless of the prize. Gain support of the school/teacher (or other) that you are engaging.

##### Community Awareness Workshop

- To ensure good attendance, ensure events organised by the project do not clash with other local events and ensure plenty of notice is given to the community.

##### Purchase of materials

- Some materials ordered for the construction of ten composting toilets was inaccurate with an excess of some materials and not enough of others.



- Do not rush architects in ordering materials and request SOPAC keep funds flexible to accommodate for miscalculations of materials needed for demonstration aspect of the project.

#### Construction of Composting toilets on Family owned land

- Consider land issues before proposing construction. Create awareness with the Kaitasi. (This should be done prior to applications being made and objections raised so that it does not appear forceful or put unwanted pressure on the Kaitasi).

#### World Water Day (Week) 2011

- Breakdown in organisation, communication and an overload of activities making management of week difficult.
- Nominate only 1 events coordinator to oversee all activities and improve communication. Do not be too enthusiastic in number of activities.

#### **Experiences of twinning/sharing with other projects**

In twinning with the PACC Tuvalu project, many benefits include cost sharing (of office space and equipment) and sharing promotional and awareness raising efforts. It is suggested that other projects would have much success and benefits should they attempt the same.

was decided early on that the IWRM Tuvalu and Pacific Adaption to Climate Change (PACC) Tuvalu projects should twin and form a loose partnership to help ensure the success of the projects. PACC Tuvalu considers water management as its adaption to climate change and many elements of its original outputs including: a water section of a Climate Change Policy and construction of Composting Toilets, mirror IWRM Tuvalu's outputs.

PACC and IWRM established offices together at the Water Sector site in spite of PACC falling under the Environment Department. Twinning included the sharing of costs for internet access and office equipment such as photocopiers and air conditioning. The National Water Sanitation Steering Committee (NWSSC) and share meetings, administration costs and work govern both projects. In considering community and stakeholder engagement, IWRM collaborated with PACC to form a Communication Committee and many engagement and awareness raising activities were developed and realised in partnership, sharing costs and outputs.

IWRM supported PACC developing the National Climate Change Policy; similarly, PACC is supporting IWRM in developing its Water Act and Policy. PACC also sits on IWRM's Technical Committee.

It is recommended that related projects twin in this manner as much as possible to encourage synchronisation of activities and outputs, better communication between projects, government agencies and policy makers and most importantly; a clear concise message to communities and stakeholders increasing the projects validity and effectiveness.

#### **7.2 Replication and Scaling Up**

The Replication Strategy (Annex 8) for the Tuvalu IWRM Project will take the lessons learned from the successful community engagement used to promote the falevatie and replicate these strategies on the outer islands. Using the example of establishing a National Steering Committee this will be replicated also on the outer islands in the form of a Local Steering committee or group to oversee the construction of falevatie. From the falevatie construction experience in Funafuti a Falevatie Construction Manual was developed, builders in the outer islands will use this to guide construction. The manual will be translated into to Tuvaluan so that it will be clearly understood by all who use it. Following the success of the "Falevatie" documentary, a follow up documentary has been developed that focuses on the technical aspects of the falevatie and on the environmental and health benefits it can provide. This documentary is used for promoting the systems at community and national government levels.



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

### 8.1 Scaling-Up to broader Integrated Land, Water and Coastal Management

The priority actions of the IWRM project have been to establish a National Coordinating APEX Body, develop national water and sanitation regulations and policies, support the development and implementation of wastewater management systems and develop management tools to assist in the management for water and wastewaters.

The concept has been embraced as a conduit to Tuvalu national goals of taking a more integrated approach to natural resource management through integrating management of groundwater and coastal pollution. Existing National Strategy all clearly make this link. The next steps are to broaden governance structures, through focussed technical working groups or plenary such as the PSC/DCC/Cabinet. Embracing a holistic approach has already started within Ministry of Environment who now host climate change, biodiversity, water and sanitation, and sustainable land management programmes.

With sanitation being a critical element in both using scarce water supplies and in the contamination of groundwater and coastal waters, it was considered essential that sanitation issues be addressed in the Water and Sanitation Policy. The R2R approach also embraces this approach, and given that other donors are now better placed to take the results of the IWRM Demonstration Project and execute larger-scale infrastructure projects of this nature, the suggestion for the next phase is for the IW project will build from IWRM successes and continue to support the delivery of falevatie throughout Tuvalu. Developing new community networks and strengthening existing ones, the project will provide on-going strategies for community awareness of environmental issues and the benefits of improved waste and sanitation management. These strategies will be developed in partnership with the Department of Health and Department of Fisheries, to include a more holistic view of the challenges facing Tuvalu and introduce the links between land management practices, the affects on coastal waters and public health. In order to support this extensive community engagement strategy, a database of appropriate and accurate information materials about environmental and public health will be collected and made available for public use at the local library in Funafuti and potentially an online source. Investigations into mechanisms for sustainable financing of falevatie, with particular attention to poorer households will be conducted. These could involve a type of sanitation marketing or community based social marketing approach.

There are many privately and communally owned piggens on Funafuti that contribute a high nutrient waste stream to the ground and coastal water systems. A central component to the IW project will be the development and installation of dry-waste piggery systems to address this. In partnership with the local governing body, Kaupule, and the Department of Agriculture management development plans will be created with community input and a dry-waste piggeries expert to facilitate the strategies. Management arrangements (community group, Kaupule run groups) will be investigated to better coordinate efforts to convert current piggeries and to manage their maintenance. The project will convert and test 10% of the demonstration site piggeries.

To continue the significant efforts of the IWRM in developing and ultimately receiving endorsement for the National WSP the IW project will identify and strengthen links between key stakeholders in order to initiate development of a National Response to Drought Management Plan. Following the lessons learned from the successful community and government engagement for the WSP, the IW would identify gaps and opportunities and work with all stakeholders toward successful development and endorsement of the National Drought Plan.

In close collaboration with the Ministry of Fisheries, Health, land management and biodiversity programmes, a programme of desk reviews and field studies can establish baselines, identify technology options, system design, awareness raising, capacity building, regulatory frameworks, construction, distribution and on-going monitoring for establishing a feasible national waste management system for Tuvalu. For more details on the proposed concept see the logframe in Annex 9.





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## Annex 1: National Water and Sanitation Steering Committee Members

Chairperson  
Vacant at time of writing



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Ministry of Public Utilities  
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Disaster Coordinator  
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Vaitupu Island Community Leader  
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## Annex 2: National Water and Sanitation Steering Committee ToR

The Pacific Adaptation to Climate Change Project (PACC) is aimed at building resilience to impacts of climate change in selected countries in the key vulnerable socio-economic sectors of coastal zone and associated infrastructure, water resources, food production and food security. PACC will also assess the range of financial instruments and investments needed at the national and regional level so that adaptation financing is sustainable.

The IWRM project aims at improved water resources management and water use efficiency in Tuvalu in order to balance overuse and conflicting uses of scarce freshwater resources through policy and legislative reform and implementation of applicable and effective Integrated Water Resources Management (IWRM) plans.

### Duties and Responsibilities

The National Water and Sanitation Steering Committee (NWSSC) will be responsible for supervising project execution. This will include evaluating project outputs to ensure that project activities are being carried out in a timely manner and to acceptable levels of quality, and reviewing the status and needs of country throughout project implementation. The NWSSC will provide a policy and technical platform for the project and in that context it will have the following duties:

- Ensuring that PACC/ IWRM in-country activities are consistent with national development priorities and objectives;
- Ensuring that all relevant stakeholders of PACC/IWRM project in the country are kept informed and consulted on the progress of implementation of activities;
- Lay down policies defining the functions, responsibilities and delegation of powers for the local implementing agency or project management unit of PACC/IWRM;
- Coordinate and manage in consultation with the NPC the overall project activities and the budget as described in the work plan;
- Be responsible for the PACC/IWRM in-country activities that are to be implemented by the various implementing partners;
- Provide guidance on the implementation of specific national activities as agreed in the work plans.
- In consultation with NPC and through RPM/SPREP and SOPAC, request the use of regional/international consultants and experts to implement the various activities, where relevant;
- Cooperate and coordinate with external experts (regional organisations, national consultants, regional consultants and/or international consultants) and provide them with necessary input and assistance;
- Review draft reports by consultants and experts engaged by the NWSSC;
- Review and endorse quarterly progress and financial report prepared by NPC for submission to RPM/SPREP and SOPAC.
- Facilitate coordination of project activities across institutions;
- Review the project activities, and their adherence to the work plan set forth in the project document;
- Take decisions on the issues brought to its notice by SPREP/SOPAC and other cooperating institutions, and provide advice regarding efficient and timely execution of the project;
- Initiate remedial action to remove impediments in the progress of project activities that were not envisaged earlier;
- Monitor and review the progress of the project implementation against its stated outputs, including progress reports prepared by the NPM/NPC;
- Review and approve the project work plans and budgets;
- Review and approve the monitoring and evaluation timetable;
- Providing strong political support and overall policy advice for the development and realization of the project;
- Assist in mobilizing available data and expertise;

### Members

The National Water and Sanitation Steering Committee on Climate Change already exist. In the preparatory phase of PACC/IWRM, the NWSSC have been used to determine the priorities for adaptation implementation within each country. However, given that PACC is focused on implementing adaptation activities in pilot site where as IWRM will focus on managing of waste water on Fogafale, Funafuti and it will be important for the membership to include:

- Representatives of civil society organizations and relevant NGOs, particularly working within communities where the project is set;
- Representatives of island/community/village, local-level, and provincial governments;
- The NPC will serve as secretariat to the NWSSC.

### Meeting Frequency

The NWSSC will meet once a Quarter and when the need arises



## Annex 3: Stakeholder Analysis and Engagement Action Plan

Stakeholder Engagement Self Analysis				
Stakeholder Engagement Activities	Potential Indicators	Score (1-6)	Reason for Score	Proposed Change/Improvement
There is sufficiently wide representation of Stakeholders on Project Steering Committee (horizontal integration across sectors) (i.e. Economic, Environment, Health, Social, Religious, Marginalized Groups, Business, Private Interest, Aid groups, Political etc)	Large Committee with representatives from all relevant ministries, NGOs, public and private interests, community, etc	4.5	We do not have all religious groups only the main one (EKT). Similarly private enterprises are not represented nor some marginalised groups.	It could be tricky to invite other religious groups as there is animosity between EKT (main religion) and others. All the more reason to invite them. Same vulnerable groups.  Representatives often come in place of specifically invited persons sometimes different representatives who do not know what we are on a because they missed the previous meetings, are not interested and will come again for another year as the office "take turns" in attending meeting
Marginalized groups are represented on the Project Steering Committee (i.e. Women's Groups, Youth, Religious minorities etc)	Women's Groups, Youth, Religious minorities representatives in attendance	5	Women and youth are represented as are outer islands and rural communities. Religious minorities not present.	Vulnerable groups and individuals are most difficult to access due to local structure (among other things) and unlikely to attend due to internal socialisation about roles and acceptable participation – especially if expected to speak up in opposition to (for example) the Director of Health or Secretary of Works etc...  Religious reasons as above.
There is sufficiently wide representation of Stakeholders on the National Apex Body (horizontal integration across sectors) (i.e. Economic, Environment, Health, Social, Religious, Marginalized Groups, Business, Private Interest, Aid groups, Political etc)	Large Committee with representatives from all relevant ministries, NGOs, public and private interests, community, etc			Don't know about this apex body...
Marginalized groups are represented on the National Apex Body (i.e. Women's Groups, Youth, Religious minorities etc)	Women's Groups, Youth, Religious minorities representatives in attendance			As above
There is sufficient vertical integration across sectors on the Project's Steering Committee (higher level government to community level interests)	Representatives from higher level government, mid level, and community interest in attendance	5.5	Very good range in participants	0.5 – difficult to ensure all are participating actively (not just tokenism)
There is equal gendered representation on the Project Steering Committee (attendance)	1:1 ratio of male:female attendees	4	There is a good balance	Most high ranking positions are that of men
There is equal gendered representation in community engagement efforts (attendance)	1:1 ratio of male:female attendees	4	There is an equal balance	Community activities are not gender considerate (ie – giving women space to speak freely)
The Steering Committee meets frequently (at least once per quarter) with good attendance	Quarterly Steering Committee meetings with >75% attendance	4	Until 2011 NWSSC met regularly without problem	2011 has highlighted issues with participants availability. Sharing community with PACC has complicated organisation
Project related data and information is freely shared amongst stakeholders	Databases for storing project information that are accessible by all stakeholders	5	IWRM is willing to share all information and assist all in whatever way possible.	Not all departments/projects are as forthcoming with sharing information
Key stakeholders are actively involved and have full buy-in and support for the project	Key stakeholders are completing tasks as assigned and moving project implementation forward (seen in workplan)	2	No support from within the steering committee.  Other stakeholders have been more active with participation (ie informal community leaders, Falaletia homeowners, ministry of health, Red Cross, other water project etc)	Steering committee has not performed any tasks in assisting the project outside of meetings and have not been supportive when assistance has been requested. Financial incentives are needed to encourage the steering committee.
Stakeholder Engagement and Steering Committee meetings are conducted in a language that everyone understands and can participate in	Participation (verbal dialogue) in chosen language by all participants	6	All meetings in Tuvalu with bilingual notes and minutes	none
All stakeholders are given the chance to participate freely in discussions	Pass the shell around, all people are speaking and contributing	4	Good tradition of open floor at end of meetings (as well as during).	Internal and social constraints have unseen impacts on willingness to participate / speak up.
Women participate equally to men	Men and women are completing work assignments on time, with equal workloads, speaking at meetings	4	No work given to stakeholders	As above
Separate consultations have been conducted for women and men	Separate meetings are held with women and men, particularly at the community level, to discuss project effects on their livelihoods	2	none	We have been given gender mainstreaming training and will be gender sensitive with the water policy consultations etc.  Women have asked for separate awareness raising workshops so that they may speak more freely and ask questions to relieve concerns etc.
Meeting times and locations consider the needs of the stakeholders and provide food and/or transportation to reduce the burden of attendance	Invoices for food, travel provision, times of meetings appropriate for professionals, parents, farmers, fishermen etc.	5.6	Sitting allowances are very generous	Meetings cannot consider time in consideration of both needs of office workers (at home) and fishermen. This needs further consideration.
Direct community consultation and involvement	Meeting documentation summary	5.6	Good community engagement and participation. Project is aware of providing a "space" and opportunities for the community to express concerns and ask questions of the project. Wide ranges of methods have been used.	Timing may have been unsuitable for some minority groups.  Internal and social constraints have unseen impacts on willingness to participate / speak up.

Tuvalu IWRM Project Logframe (2013)

Output No.	Output	Key Indicators	Means of Verification	Assumptions/Risks	Action Origin
Project Goal	Reduce Tuvalu's vulnerability to drought and climate change and improve human health and the environment through improving wastewater management in an IWRM framework				
PURPOSE	To save water and protect human health and the environmental through improvements to sanitation systems				
Output No.	Output	Key Indicators	Means of Verification	Assumptions/Risks	Action Origin
COMPONENT 1					
1	<i>National Policy/Legislation</i> Consider the suitability of national policy and legislation framework to enable better wastewater and water management	Necessary changes to national legislation and policies to mainstream integrated water and wastewater management	National legislation and policies	Reliant on co-funded activities; Political will; Capacity to attract/retain suitably qualified personnel	In-country IWRM Team + consideration of consultant
1.1	Consider the revision of national legislation and policy to address gaps and support opportunities for better water and wastewater management	Necessary changes to national legislation and policies to mainstream integrated water and wastewater management	National legislation and policies	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment including but not limited to political commitment and financial stability and changes in legislation and policy; capacity to attract/retain suitably qualified personnel	
1.1.1	Identify gaps and opportunities for managing water and wastewater in an IWRM framework	Report recommending strategies	Accepted by National Water and Sanitation Steering Committee (NWSSC)	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment, including but not limited to political commitment and financial stability; capacity to attract/retain suitably qualified personnel; Extended period of wet weather reduces	
1.1.2	Recommendation to amend legislation and policy	Recommendation to relevant ministries and Cabinet	Reports endorsed by Cabinet		
1.1.3	Monitor and support recommendations	Interaction accepted	Reports of communications		



							stakeholder interest		
1.2	Review Draft Water Act and Water Policy to support implementation of wastewater management	Water Act and Water Policy passed by Parliament	Enactment of legislation and adoption of policy	Enactment of legislation and adoption of policy	Enactment of legislation and adoption of policy	Enactment of legislation and adoption of policy	Reliant on co-funded activities; Political will; Capacity to attract/retain suitably qualified personnel	Reliant on co-funded activities; Political will; Capacity to attract/retain suitably qualified personnel	In-country IWRM Team + consideration of consultant
1.2.1	Identify gaps and opportunities for managing water and wastewater in an IWRM framework	Report recommending strategies	Report recommending strategies	Accepted by NWSSC	Accepted by NWSSC	Accepted by NWSSC	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment, including but not limited to political commitment and financial stability; capacity to attract/retain suitably qualified personnel; Extended period of wet weather reduces stakeholder interest	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment, including but not limited to political commitment and financial stability; capacity to attract/retain suitably qualified personnel; Extended period of wet weather reduces stakeholder interest	
1.2.2	Draft Legislation and policy	Policy tabled in Cabinet Bill tabled in Parliament	Policy tabled in Cabinet Bill tabled in Parliament	Parliament record	Parliament record	Parliament record			
1.2.3	Follow strategy to support progress to adoption	Support for policy tabled in Cabinet and Bill tabled in Parliament	Support for policy tabled in Cabinet and Bill tabled in Parliament	Adoption of Water Act and National water policy	Adoption of Water Act and National water policy	Adoption of Water Act and National water policy			
Output No.	Output	Key Indicators	Key Indicators	Means of Verification	Means of Verification	Means of Verification	Assumptions/Risks	Assumptions/Risks	Action Origin
COMPONENT 2	Sound Governance to provide confidence in the transparency, accountability and credibility of decisions	Establishment of the Water and Sanitation Steering Committee, with public accountability and supporting Government agency structures	Establishment of the Water and Sanitation Steering Committee, with public accountability and supporting Government agency structures	Cabinet endorsement of NWSSC and Government roles and responsibilities	Cabinet endorsement of NWSSC and Government roles and responsibilities	Cabinet endorsement of NWSSC and Government roles and responsibilities	Political will and an enabling legislative, budget and political environment	Political will and an enabling legislative, budget and political environment	
2.1	Reconvene Water and Sanitation Steering Committee, responsible for delivering the National Water and Sanitation Plan, with public accountability	Reconvene of the Water and Sanitation Steering Committee	Reconvene of the Water and Sanitation Steering Committee	Cabinet Endorsement	Cabinet Endorsement	Cabinet Endorsement	Political will and an enabling legislative, budget and political environment	Political will and an enabling legislative, budget and political environment	In-country IWRM Team + NWSSC
2.1.1	Revisit Terms of Reference and Roles and Responsibilities	Terms of Reference Roles and Responsibilities	Terms of Reference Roles and Responsibilities	Cabinet endorsement	Cabinet endorsement	Cabinet endorsement	Political commitment	Political commitment	
2.1.2	Reconfirm members of Steering Committee	Appointment of NWSSC members	Appointment of NWSSC members	Cabinet endorsement	Cabinet endorsement	Cabinet endorsement	Members will be appointed based on their capacity to deliver outcomes	Members will be appointed based on their capacity to deliver outcomes	
2.1.3	Establish executive support for Steering Committee	Executive support appointed and finance in place	Executive support appointed and finance in place	NWSSC endorsement	NWSSC endorsement	NWSSC endorsement	Capacity to attract and retain suitable candidates; Sustainable funding strategy beyond project	Capacity to attract and retain suitable candidates; Sustainable funding strategy beyond project	
2.2	Define water and sanitation roles and responsibilities and consider improvements and changes	Statement of agency roles and responsibilities	Statement of agency roles and responsibilities	Report endorse by Cabinet	Report endorse by Cabinet	Report endorse by Cabinet	Political and government agency commitment	Political and government agency commitment	In-country IWRM Team + Paulson Panapa
2.2.1	Identify options for improving government agency roles in water and wastewater management.	Report to government providing options for improving administrative arrangements for managing water and wastewater	Report to government providing options for improving administrative arrangements for managing water and wastewater	Cabinet endorsement	Cabinet endorsement	Cabinet endorsement	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns	
2.2.2	Define Agency roles and responsibilities	Formal statement of government agency roles and responsibility	Formal statement of government agency roles and responsibility	Cabinet endorsement	Cabinet endorsement	Cabinet endorsement			
Output No.	Output	Key Indicators	Key Indicators	Means of Verification	Means of Verification	Means of Verification	Assumptions/Risks	Assumptions/Risks	Action Origin
COMPONENT 3	Undertake the development of plans and Strategies, as required, to enhance and direct water and wastewater management.	Need identified	Need identified	Report to NWSSC	Report to NWSSC	Report to NWSSC	Political commitment; Changes in stakeholder roles, responsibility and focus; Enabling legislative and policy changes are adopted; capacity to attract and retain suitable personnel	Political commitment; Changes in stakeholder roles, responsibility and focus; Enabling legislative and policy changes are adopted; capacity to attract and retain suitable personnel	
3.1	Undertake water and sanitation planning as required to increase technical, institutional and stakeholder capacity. Planning undertaken through community	National Water and Sanitation Plan (NWSP)	National Water and Sanitation Plan (NWSP)	Cabinet endorsed	Cabinet endorsed	Cabinet endorsed			In-country IWRM Team + NWSSC





3.3	Capacity Building Strategy is developed to increase stakeholder capacity to a level that enables sustainable water and wastewater management and participation from all sectors across government, non-government organisations and the community	Capacity Building Strategy Implemented	NWSSC endorsement	In-country NWSSC	Team +
3.3.1	Identify capacity building needs assessment for stakeholders, governance, technical and institutional needs, identifying long-term needs and priority areas for capacity building	Capacity needs assessment	NWSSC endorsement	Assume that assessment is able to be representative of broad stakeholder interests; changing political and stakeholder focus may date the strategy rapidly	
3.3.2	Develop capacity building strategy to address capacity needs across all sectors	Capacity Building Strategy	NWSSC endorsement	Assume that assessment is able to be representative of broad stakeholder interests; changing political and stakeholder focus may date the strategy rapidly	
3.3.3	Implement Capacity Building strategy including annual reviews	Annual reporting identifies needs for lower awareness development, uptake, and increasingly complex capacity development needs	Annual project reporting endorsed by NWSSC	Assume that assessment is able to be representative of broad stakeholder interests; changing political and stakeholder focus may date the strategy rapidly	
3.3.4	Conduct awareness raising sessions and training as necessary on appropriate sanitation systems for Tuvalu, including the consideration of micro-business opportunities (drafting/building services).	Trained 30 people on Fogafale and 15 people on outer islands Construction Complete	NWSSC endorsement of project reporting	Assume availability and commitment of people to be trained; Capacity to develop training course to address a wide level of initial capacity	
3.4	Participation Strategy that facilitates stakeholder participation throughout the planning and implementation phases	Participation Implemented	NWSSC endorsement	Changes in stakeholder roles, responsibilities and focus; Significant changes in enabling environment, including but not limited to political commitment and financial stability; Capacity to retain up-skilled personnel; Extended periods of rain may diminish stakeholder interest	In-country NWSSC
3.4.1	Develop participation strategy that facilitates greater stakeholder engagement, including vulnerable stakeholders	Participation Strategy	NWSSC endorsement	Changes in stakeholder roles, responsibilities and focus; Significant changes in enabling environment, including but not limited to political commitment and financial stability; Capacity to retain up-skilled personnel; Extended periods of rain may diminish stakeholder interest	
3.4.2	Implement participation strategy including annual reviews	80% feedback received from community on preferred sanitation system and 100+ volunteers to trial new or improved systems	Annual project reporting endorsed by NWSSC	Changes in stakeholder roles, responsibilities and focus; Significant changes in enabling environment, including but not limited to political commitment and financial stability; Capacity to retain up-skilled personnel; Extended periods of rain may diminish stakeholder interest	
3.5	Replication Strategy identifying water and wastewater management needs at a national level, identifying mechanisms for transferring	Replication Strategy	NWSSC endorsement	Changes in stakeholder roles, responsibilities and focus; Significant changes in enabling environment, including but not limited to political commitment and financial stability; Capacity to retain up-skilled personnel; Extended periods of rain may diminish stakeholder interest	In-country NWSSC



	learnings and tools and key policy and financial enabling factors, revised to identify lessons and tools as they become available (Methodology)	Replication Strategy	NWSSC endorsement	limited to political commitment and financial stability; Capacity to retain up-skilled personnel; Extended periods of rain may reduce stakeholder interest	
3.5.1	Develop replication strategy that facilitates uptake of project learnings at island, national and regional levels	Extend new innovation to outer islands by project end	End of project report	Political will; Changes in stakeholder roles, responsibility and focus; Enabling legislative and policy changes are adopted; Capacity to attract and retain suitable personnel; Period of good rains may reduce stakeholder concerns	
3.5.2	Transfer of best practices in water resource protection and conservation to rest of Tuvalu, the Pacific Region and beyond (including annual reviews of learnings)	Report to member countries on project learnings and opportunities for uptake		Political will; Changes in stakeholder roles, responsibility and focus; Enabling legislative and policy changes are adopted; Capacity to attract and retain suitable personnel; Period of good rains may diminish stakeholder concerns	
	<b>Output</b>	<b>Key Indicators</b>	<b>Means of Verification</b>	<b>Assumptions/Risks</b>	<b>Action Origin</b>
<b>COMPONENT 4</b>	Review all scientific and other information/data and consider further information needs.	Literature Review (Study reports)	Study report available / NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, and that complex systems can be simplified to provide meaningful results	
4.1	Obtain further relevant information as required	Information applicable and up to date	Undated report available	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, and that complex systems can be simplified to provide meaningful results	In-country IWRM Team + NWSSC
4.1.1	Maintain continuous up to date information on all relevant topics, including but not limited to scientific and social research by National and international NGO's and Government agencies.	Quarterly report on latest information	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, and that complex systems can be simplified to provide meaningful results	
4.2	Assess current status of Funafuti sanitation and wastewater impacts	Report (Updated data)	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained	In-country IWRM Team + NWSSC
4.2.1	Update statistics on flush toilets with septic tanks; pour flush latrine and no toilets on Fongafale	Study report	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained	
4.2.2	Update health statistics on waterborne diseases	Study Report	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained	
4.2.3	Review available water quality information for Fongafale lagoon	Study Report	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained	



4.2.4	Conduct random surveys of attitudes/perceptions regarding different types of toilets and pollution of marine environment	Survey Report 80% feedback received from community on preferred sanitation system and 100+ volunteers to trial new or improved systems	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained; Suitable personnel can be attracted and retained; Extended periods of rain may reduce stakeholder interest	In-country IWRM Team + NWSSC
4.2.5	Undertake assessment of groundwater resources	Study Report	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained; Extended periods of rain may reduce stakeholder interest	
4.3	Revisit cost benefit analysis report and update where necessary.	Report with recommendations	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained; Extended periods of rain may reduce stakeholder interest	
4.3.1	Develop appropriate design of dry sanitation system for Tuvalu based on feedback from current CT users, previous trainees and PWD staff	Design Report	NWSSC endorsement of design	Reliant on reliability of outcomes of surveys and studies	
4.3.2	Invite volunteer households to trial composting toilets, improved septic systems	Uptake of 80 trial systems 50% of septic systems improved to functioning standard	NWSSC endorsement of project reporting	Stakeholder perceptions may be difficult to overcome; Political commitment; capacity to identify relevant champions	
4.3.3	Construct minimum of 40 composting toilets in cross section of Fongafale households	40 dry sanitation systems complete during the project within the specified or identified areas	NWSSC endorsement of project reporting	Stakeholder perceptions may be difficult to overcome; Political commitment; capacity to identify relevant champions	
4.3.4	Evaluate project against socio-economic and physical indicators. Refine design of sanitation systems based on user feedback, operational issues and effective treatment	Study Report	NWSSC endorsement	Political and stakeholder commitment, particularly those with the sanitation systems; Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Extended periods of rain may reduce stakeholder interest	
4.3.5	Develop costed strategy to replicate preferred option	Study Report	NWSSC endorsement of report	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results	

4.3.6	Identify mechanisms for further installations (beyond capacity)	Funding found to implement strategy	NWSSC endorsement of funding source	Capacity to attract external funding or develop self-funding mechanism; Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Significant changes in enabling environment including but not limited to political commitment and financial stability; lack of development of enabling policy and legislation; capacity to attract/retain suitably qualified personnel
4.3.7	Monitor trial sanitation systems/community response	Study Report with recommendations based on monitoring data and survey 30% reduction in targeted household water use	NWSSC endorsement of study report	Stakeholder commitment; Perception of increased available household water; Drought or high rainfall influencing perceptions
4.3.8	Report on study, including comparing various building materials to reduce cost and demand on coastal aggregate etc, and local aesthetics re design and materials	Study Report	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained; Suitable personnel can be attracted and retained; Extended periods of rain may reduce stakeholder interest; Household commitment maintained through trial
4.4	Undertake a study on improved septic systems or other treatment systems to determine their suitability as a wastewater management solution.	Study Report	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained.
4.4.1	Review of sludge handling and options for disposal/treatment	Study Report	NWSSC endorsement	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Suitable personnel can be attracted and retained.
4.4.2	Review the suitability of the existing septage treatment site	If necessary, obtained land lease agreements by the end of Year 3 of the project	Lease signed	Stakeholder and community support, political will, skilled people can be attracted and retained available land.
4.4.3	Replace, repair septic systems or provide alternative system at volunteer households	Maximum uptake within project funding	Report endorsed by NWSSC	Stakeholder and community support, homeowners volunteer, skilled people can be attracted and retained.
4.4.4	Proceed with costed design of preferred option for sludge treatment and negotiate lease of private land if government lease site not acceptable to community	Costed design complete. If necessary, obtained land lease agreements by the end of Year 3 of the project if necessary	NWSSC endorsement of design Lease signed	Stakeholder and regional community support, political will, skilled people can be attracted and retained available land.



4.4.5	Identify funding mechanism or source	Funding found to implement strategy	NWSSC endorsement of funding source	Capacity to attract external funding or develop self-funding mechanism; Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation; capacity to attract/retain suitably qualified personnel	
4.4.6	Monitor trial sanitation systems/community response	Study Report with monitoring data informing recommendations	NWSSC endorsement of study report	Adequate resources available, adequately skilled people can be attracted and retained, will of volunteer homes	
<b>Output No.</b>		<b>Key Indicators</b>	<b>Means of Verification</b>	<b>Assumptions/Risks</b>	<b>Action Origin</b>
<b>COMPONENT 5</b>		Develop tools to aid the management of water and wastewater management	NWSSC use of tools	Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; Increased rain may reduce political and stakeholder interest	
5.1	Incorporate regulations guidelines and design of roof catchments, rain storages and sanitation systems in Tuvaluan National Building code.	National Building Code	NWSSC endorsement	Political will and an enabling legislative, budget and political environment. Capacity to enforce. Period of rain may reduce interest; capacity to attract and retain suitable personnel	In-country IWRM Team + NWSSC + consideration of consultant
5.1.1	Present a submission to cabinet, supported by PWD, to gain support for revising and updating the building code legislation and to incorporate regulations, guidelines and design of roof catchments, rain storages, and sanitation systems in the Tuvalu National Building Code.	Report provided to cabinet	Cabinet support provided.	Political will and an enabling legislative, budget and political environment. Capacity to enforce. Period of rain may reduce interest; capacity to attract and retain suitable personnel	
5.1.2	Produce regulations, guidelines and design of roof catchments, rain storages, and sanitation systems for inclusion into the revised Tuvalu National Building Code.	National Building Code	NWSSC endorsement	Political will and an enabling legislative, budget and political environment; Period of rain may reduce interest; capacity to attract and retain suitable personnel	
5.1.3	Follow strategy to support progress to adoption	Building Code tabled in Cabinet	Adoption of Building Code		
5.2	Support development of model and monitoring program to provide reliable information on the status of national rainwater resources (PACC project)	Model Developed and used	NWSSC endorsement and use	Political will and an enabling legislative, budget and political environment; Period of rain may reduce interest; capacity to attract and retain suitable personnel; Capacity to develop reliable model sufficient to inform management	In-country IWRM Team, In-country PACC Team + NWSSC
5.2.1	Support the development of a model and monitoring program to provide reliable information on the status of national rainwater	Model Developed	NWSSC endorsement	Political will and an enabling legislative, budget and political environment; Period of rain may reduce interest; capacity to attract	

					and retain suitable personnel; Capacity to develop reliable model sufficient to inform management	
5.2.2	Resource and implement monitoring program	Model used to inform management decisions	Reporting to NWSSC		Political will and an enabling legislative, budget and political environment; Period of rain may reduce interest; capacity to attract and retain suitable personnel	
	<b>Output</b>	<b>Key Indicators</b>	<b>Means of Verification</b>	<b>Assumptions/Risks</b>	<b>Action Origin</b>	
<b>COMPONENT 6</b>	Support all on-ground works to improve water and wastewater management	Support provided	Reports and funding applications produced.	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation; capacity to attract/retain suitably qualified personnel; increased rain may reduce stakeholder commitment		
6.1	Support improvements to household rainwater collection and storage to reduce drought stress	Support provided	Reports and funding applications produced.	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation; capacity to attract/retain suitably qualified personnel; increased rain may reduce stakeholder commitment	In-country IWRM Team, In-country PACC Team + NWSSC	
6.1.1	Supporting installation of increased guttering and rainwater tanks to improve the capture and retention of rainwater	Support provided	Reports and funding applications produced.	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation; capacity to attract/retain suitably qualified personnel; increased rain may reduce stakeholder commitment		



Output No.	Output	Key Indicators	Means of Verification	Assumptions/Risks	Action Origin
COMPONENT 7	To successfully deliver the Tuvalu Ecosan Demonstration Project				
7.1	Successfully managed project	Final Project Report	GEF endorsement	Capacity to retain personnel and political and stakeholder momentum through to project completion	Team + Paulson Panapa
7.1.1	Recruit Project Manager	Recruitment of Project Manager	NWSSC endorsement	Capacity to attract/retain appropriate candidates	
7.1.2	Establish Project Management Unit office	Establishment of a Project Management Unit Office	NWSSC endorsement	Available offices	
7.1.3	Identify and clarify stakeholders	Stakeholder list	NWSSC endorsement	Changes to stakeholders throughout the project have the potential to change project focus	
7.1.4	Re-visit project design with stakeholders and refine design and approach where necessary	Agreed Project Design	NWSSC endorsement	Changes in stakeholder representatives or stakeholder politics may cause delays at review stages associated with different positions on issues or learning curves	
7.1.5	Source additional funding to add value to project outcomes	Additional funding obtained	NWSSC endorsement	Assumption that funding is secured prior to project inception. Inability to source additional funding will limit value-added project components	
7.1.6	Manage budgets, deliverables and timelines	Annual Reports	NWSSC endorsement	Further changes to GEF budgets or co-funding may compromise all three components. Risks identified above also likely to impact on budgets, deliverables or timelines	
7.1.7	Complete reporting commitments	Final Project Report	GEF endorsement	Capacity to retain personnel and political and stakeholder momentum through to project completion	

Implementing Sustainable Water Resource and Wastewater Management in Pacific Island Countries



# GEF PACIFIC IWRM PROJECT RESULTS NOTE

<http://www.pacific-iwr.org/results>

RSC 5 2013

## Integrated Sustainable Wastewater Management (Ecosan) for Tuvalu



*Construction workshop for island  
contractors to support community  
replication*

### **Top 3 Project Results**

1. Successfully engaged the Tuvaluan community, government and politicians in the uptake of compost toilets, to the point where it is now seen nationally as the preferred sanitation option and is included as such in the National Water and Sanitation Policy.
2. Successfully designed and replicated across four project countries a sanitation solution (eco-san) appropriate for SIDS, using local expertise to adapt existing international technologies and community participation to garner support and adaptation. 40 systems installed on Funafuti with planned scaling up leveraged through the EU for a further 135 for Funafuti and outer islands.
3. Establishment of a National Water and Sanitation Policy (2013) that has mainstreamed IWRM water and sanitation solutions and concepts demonstrated through this project.

**Pisi Seleganiu**  
**afaaso80@gmail.com**  
**Public Works Department**

## 1. PROJECT OBJECTIVE

*To demonstrate that improved sanitation technology and practices can provide protection of primary and secondary water resources, marine biodiversity, livelihood, and food security, and practically demonstrate the links between public health and the conservation of natural assets*

## 2. RESULTS: PROCESS

*From a baseline of little interest in composting toilets to a success story other countries are looking to emulate, the Tuvalu GEF Pacific IWRM project has demonstrated the value of engaging stakeholders. This core IWRM and project approach has facilitated a national-level change in attitudes to sanitation and water management, development of a national water and sanitation policy, increased water security and is dramatically increasing access to improved sanitation in Tuvalu.*

*Initially, the project struggled to find families to trial the first ten compost toilets. A communication and engagement campaign involving innovative strategies including a toilet roadshow, a competition to name the Tuvaluan designed toilet (the 'Falevatie'), focus groups and targeted media campaigns and numerous school and community sessions were built around a sound technical solution. Less than three years later over 25% of Funafuti's households (275 families) are seeking to install compost toilets.*

*Involvement in the development of a National Water & Sanitation Policy has proven the success of project stakeholder engagement which is reflected in the endorsement of the WSP as well the inclusion of eco-sanitation as a sanitation option of choice for Tuvalu. The inclusion of gender targets in senior national water governance is a reflection of the empowering nature of the project and a positive response to pilot gender awareness in water workshops.*

*The project is also assisting with drought management, particularly relevant following the 2011 drought and national State of Emergency, through the development of a national water storage model, providing critical water security management and planning information.*



**Figures 1 and 2**

The Compost Toilet Roadshow showcased the Falevatie (compost toilet) by taking the toilet to the communities. At each stop games and activities were set up and people were invited onboard to inspect the toilet and were given the opportunity to discuss the toilets and concerns with the project staff

### **2(a) INDICATOR#1: LESSONS LEARNED INCORPORATED INTO OTHER PROJECT(S) AND/OR REGULATIONS**

Despite eco-sanitation offering many benefits to low-lying Pacific islands challenged by a lack of water resources and minimal capacity for sustainable wastewater treatment and disposal, previous attempts to introduce the technology had seen many failures and no replication. The aim of the project was to replicate lessons learned by the end of the project. In the space of three years, the Tuvalu GEF Pacific IWRM project has changed this landscape, with the Tuvaluan compost toilet being adopted and adapted in Nauru, RMI and Tonga, with Nauru having expanded the application from households to schools.



The lessons identified across stakeholder engagement, capacity building and communication have helped Nauru and RMI rapidly develop positive stakeholder interest and the knowledge continues to be spread through South-South twinning exchanges.

Within Tuvalu, development partners are strongly supporting the expansion of ecosanitation both within Funafuti and to the Outer islands, with commitments already to treble the number of toilets and national and development partner plans to provide most households in the Outer Islands with access to a compost toilet.



**Figure 3:** Construction workshop, convened for island construction workers to understand the principals of twin chambers and construct the toilets themselves

## **2(b) INDICATOR#2: NATIONAL IWRM INDICATOR FRAMEWORK EMBEDDED IN FORMAL NATIONAL REPORTING**

Before the project there were no national indicator frameworks for water resource issues. The project aimed to have a national IWRM Indicator Framework endorsed by the Minister by the end of the project. In a country prone to drought and with significant water and sanitation management related environmental and health challenges, the development of national indicators was supported from community to the Minister. The absence of a monitoring and reporting mechanism meant that government, the community and other stakeholders had little knowledge of the status of water security until the next drought and no means of assessing the value of water management decisions.

The development of national IWRM indicators in early 2012 provided many stakeholders with their first opportunity to actively engage in national water management decisions. The process defined some of the management challenges for the first time (for example, the variance in livestock water use). The value of the framework was recognized immediately by the request for guidance on replicating the process in the agriculture and fisheries sectors. These indicators are in final stages of development to be approved and endorsed by Cabinet.



Figure 4: Developing national water and sanitation indicators

### **2(c) INDICATOR#3: PROPORTION OF COMMUNITY ENGAGED IN WATER RELATED ISSUES**



Figure 5: Children engaged in games associated with the Falevatie Roadshow

Prior to the project, the centrally managed water and sanitation sectors provided little scope for community engagement. From such a low baseline, percentage increase in engagement is almost meaningless. However the project sought to increase engagement by 30%. More importantly, from a position of virtually no community engagement in water related issues, the project has engaged more than 25% of Funafuti at the highest level of personal engagement, committing the household to a changed lifestyle through ecosanitation.

By continually focusing on communication and engagement the project has managed to actively engage a large proportion of Funafuti, through workshops, community and school events and Kaupule meetings. Key initiatives included the development of a national name for the compost toilet, which provided a sense of national ownership and the subsequent roadshow, engaging families through entertainment and providing access to information and an opportunity to talk through concerns.

Community engagement in governance has increased through community leaders' membership on the project committee and the national APEX body.



Figure 6: IWRM Demonstrating water quality testing

#### **2(d) INDICATOR #4: NATIONAL STRATEGY IN PLACE - DEVELOPMENT OF WATER AND SANITATION POLICY**

Before project implementation there was fragmented reference to water within other national frameworks such as the Te Kakeega II, Te Kaniva and the NAPA. The target of the project was to have a discrete National Water Policy by mid-2012. During the 2011 drought the government requested assistance from the IWRM to develop a National Water Policy. The Policy was developed with input from a wide range of community, government and NGO stakeholders the process of which culminated in a Sustainable Water Forum in 2011. The purpose of the WSP is to ensure that the people of Tuvalu have continued access to safe, reliable, affordable and sustainable water and sanitation facilities. The WSP was endorsed by Cabinet in early 2013 and launched to the public in October 2013.



Figure 7: NWSSC members with newly endorsed Water and Sanitation Policy, October 2013

#### **2(e) INDICATOR #5: MULTI-SECTORAL APEX BODY IN PLACE**

Prior to the start of the IWRM project there was a national steering committee established by the IWP, however at the end of this program the committee became inactive. The target of the IWRM project was to have a National APEX Body in place and endorsed by the Cabinet. The National Water and



Sanitation Steering Committee was re-instituted in late 2009 and has a wide membership including government and non-government actors. Membership includes many groups from the community including Kaupule, NGO's and Women's groups. The NWSSC has been critical in the development of the National WSP and is active in community campaigns. They meet quarterly to review and design IWRM work plans and monitor progress. They are the main multi-sector committee for water resource and sanitation related issues in Tuvalu and are the mechanism for advancing legislation through Cabinet.

#### **2(f) INDICATOR #6: BEST IWRM AND WUE APPROACHES DEFINED FOR TUVALU**

Reports on water and sanitation challenges had been written prior to the commencement of the IWRM, these identified water and sanitation challenges as they relate to IWRM and how the IWRM approach could be used to address these. Little was done to turn these reports into substantial change in the sector. The target of the IWRM project was to have the IWRM approach defined and endorsed by the National APEX Body. Through a nation wide consultation process these approaches were presented to and approved by the community and government institutions. These approaches have since been formalized in the National WSP and endorsed by Cabinet.



Figure 8: Community consultations on benefits of IWRM

#### **2(g) INDICATOR #7: BEST APPROACHES TO IWRM AND WUE MAINSTREAMED INTO NATIONAL AND REGIONAL PLANNING FRAMEWORKS – ECO-SANITATION ADOPTED INTO WATER POLICY**

Prior to project commencement Tuvalu had no strategy or agreed approaches to water and sanitation policy. The project aimed to define targets and priority actions for IWRM aimed at strengthening national coordination and reducing stress on vulnerable water resources for mainstreaming into national and regional planning frameworks. An intensive consultative process, involving broad cross-sectoral and community participation, enabled the definition of best approaches for water and sanitation management that were subsequently incorporated in the National Sustainable Integrated Water and Sanitation Policy. This includes the formal recognition of eco-sanitation as a sanitation option all of Tuvalu.

#### **2(h) INDICATOR #8: SECTORAL ENGAGEMENT IN FORMAL MULTILATERAL COMMUNICATION ON WATER ISSUES**

Prior to commencement of IWRM there was limited cross-sectoral engagement or communication on water issues. The project aimed to increase engagement, with a particular emphasis on strengthening communication between national government and traditional community-based governance arrangements. The NWSSC established the platform for this and, with Ministerial support for this group provided through the IWRM, up to 20 different agencies from national and local government, representatives of NGOs, and community leaders have met on a quarterly basis to discuss national water and sanitation policy and IWRM planning, review the status of various water related investment in Tuvalu, and to share information on the results of various stress reduction technologies being trialed as part of the IWRM demonstration project.

#### **2(i) INDICATOR #9: PROJECT DESIGN AND PM & E PLAN IMPLEMENTED**

At the beginning of the project there was no project design or PM&E plan and the target was to have this developed and endorsed by the NWSSC by 2011. In conjunction with NWSSC, the IWRM Project Team developed the project design and PM&E plan during a special meeting over 2 days in early 2011. After review of the documents the NWSSC approved the design and PM&E plans.

**2(j) INDICATOR #10: NATIONAL STAFF ACROSS INSTITUTIONS WITH IWRM KNOWLEDGE AND EXPERIENCE**

Prior to the project National staff had limited knowledge or experience of IWRM and it was a target of the project to increase this by project end. In order to share the ecological concepts and technical construction of the eco-sanitation toilets a week-long workshop was conducted for the IWRM Project Team and all local contractors and builders. This workshop covered construction of composting toilets, how to use and maintain the system. It also covered the advantages and disadvantages of the system so that builders could explain the process to families who were interested or were having one installed. From this training the IWRM Project Manager was then able to share the construction and ecological knowledge with the IWRM projects in RMI and Tonga. This has also resulted in the development of a Falevatie Construction Manual that was developed to help other projects and private builders with the construction of their own falevatie.



**Figure 9:** Eco-sanitation technical construction workshop

**2(k) INDICATOR #11: NATIONAL IWRM COMMUNICATION PLAN FRAMEWORK IMPLEMENTED**

Prior to the IWRM project there was no National IWRM communication plan framework. The target of the project was to have this developed and endorsed by mid-2012. Information from the community engagement report was used to guide the development of the IWRM communication plan, this included how to mobilise communities, indicating the approaches to be taken for communication activities and locally appropriate methods of engagement. This document is in the final stages of development for review by the NWSSC and ultimate endorsement by the Minister. In addition to this a Communications Committee was established in 2010 to address the obstacles faced in the implementation of the falevatie. This committee proved to be an extremely effective body for planning and implementing activities that generated community interest in the project and engaging community members to voice their concerns. The outcome of the Committee's involvement was to overcome a lot of community apprehension through targeted information campaigns leading to the acceptance of falevatie at the household level.



Figure 10: Multi-sectoral communications committee

### 3. RESULTS: STRESS REDUCTION

*Reducing water and sanitation management impacts on Tuvalu's groundwater and coastal resources has been identified as critical to the long-term sustainability of the country from a food and water security and biodiversity perspective. One of the most severe challenges to the groundwater and coastal water quality and to water security is the use of septic tanks. Many septic tanks have failed; however due to the sandy soils, even functioning tanks still do little to reduce the pollution load to the environment.*

*Stress reductions are being achieved in the project through the installation of composting toilets, which address both the household demand for water, increasing water security, and the discharge of toilet wastewater into groundwater and ultimately into coastal waters.*



Figure 11: Composting toilet installed by the project. Prior to the installation of these toilets, waste seeped into groundwater and discharged into the lagoon

### **3(a) INDICATOR#1: REDUCTION IN USE OF FRESHWATER FOR SANITATION PURPOSES DUE TO COMPOSTING TOILET INSTALLATION**



**Figure 12:** Waterless eco-sanitation toilet installed by the project

Toilets flushing into septic tanks typically use six to ten litres per flush, and represent more than 30% of household water use. In Tuvalu, where over 70% of water storages are household rainwater tanks and there is only limited commercial and agricultural water use, toilet flushing represents about 30% of national water use. During the 2011 drought resulting in a State of Emergency, flushing toilets were a significant contributor to drawing down water reserves, and ultimately the need for flushing water meant that families were often left with a choice of sanitation or drinking and cooking water. The goal of the IWRM project was to reduce this freshwater use for sanitation by 30%.

The Tuvalu GEF Pacific IWRM project has installed 40 compost toilets, reducing household water use by over 30% in these houses (representing about 5% of Funafuti's population). The co-funded installation of toilets in partnership with this project will see these reductions in about 15% of Funafuti houses. Ultimately, the changes in building regulations being developed and implemented under this project, together with development partner commitments will see similar reductions over much of Funafuti and the Tuvalu Outer Islands. With funding leveraged through the IWRM project, there will be 45 extra toilets on Funafuti and 90 on the outer islands to be constructed. It is expected that Nukulaelae will have complete coverage of compost toilets as they have expressed their interest in removing septic systems to ensure water security and climate resilience.

### 3(b) INDICATOR#2: POPULATION WITH ACCESS TO IMPROVED SANITATION



**Figure 13:** Toilets have been installed to service isolated communities previously without improved sanitation systems

The United Nations Special Rapporteur's acknowledgement of Tuvalu's serious challenge in meeting human rights in access to sanitation and drinking water highlighted the importance of this issue nationally. Nationally, 4% of Tuvaluans still practice open defecation, and during drought periods, this increases significantly. The target of the IWRM project is to increase Funafuti residents with access to improved sanitation by 5%, equivalent of about 250 people.

The provision of sustainable sanitation through the Tuvalu GEF Pacific IWRM project to 40 households is directly increasing the access to improved sanitation for about 280 people, over 5% of Funafuti's population.

Whilst the project has already exceeded the target for improving access to sanitation, the co-funded and catalytic outcomes will see a further 45 households with access to sanitation during the project period, a further 8% of Funafuti's population, exceeding the project target.

A further 90 households will have access to improved sanitation on outer islands as a result of the projects replication initiatives.



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#### 4. RESULTS: WATER RESOURCE AND ENVIRONMENTAL STATUS

*Whilst MDG statistics suggest that Funafuti has high access rates to improved sanitation and drinking water, recently the United Nations Special Rapporteur on the right to safe drinking water and sanitation declared that this did not reflect the true situation in Tuvalu. Most sanitation systems have failed and open defecation is still practiced, increasingly so during drought periods.*

*The provision of sustainable sanitation through the Tuvalu GEF Pacific IWRM is directly increasing the access to improved sanitation for 40 households, with co-funded and catalytic outcomes delivering further increases. These toilets will also alleviate some of the challenges in providing access to improved drinking water sources, significantly reducing household water use, increasing security and water availability during drought periods.*



**Figure 14:** Funafuti demonstrating the lack of surface water resources and the close proximity of the coast and lagoon to all sanitation systems

#### **3(a) INDICATOR#1: REDUCTION IN SEWAGE POLLUTION ACROSS FUNAFUTI**

Studies of Funafuti groundwater indicate that the groundwater and near shore coastal waters and sediments are heavily polluted from septic tanks, which are also a significant contributor to the eutrophication of Fongafale Lagoon and associated macro-algae blooms that clog the lagoon. This is further exacerbated by the open defecation practices in the lagoon, which increase during drought periods. Significant loss near shore habitat and reductions in fish numbers are forcing fishermen further and further into the lagoon for similar catches. The project aimed to reduce sewage pollution by 5% across Funafuti.

The installation of the 40 compost toilets has removed the sewage pollution into groundwater and subsequently into coastal waters from these 40 houses. This represents about a 6% reduction in nitrogen pollution into the groundwater. The co-funding commitments to replicate eco-sanitation to a further 60 houses in partnership with this project will deliver a further 8% reduction in sewage pollution, putting the project on track to exceed the target. Additionally, current government and development partner planning and community commitment suggest that much larger targets may be achievable.



## Annex 6: Awareness Materials Developed and Media Coverage

# The Fourth Quarter 2010 IWRM Newsletter

corals. By protecting the marine environment, fishing conditions will improve.

Through these ten families saving 30% of their household water, you and the community will benefit from an increase in available water as the government needs to supply the community with water during dry times.

The first ten Falevatie owners are

Vaea	Paeke
Toma	Taufue
Nakala	Uikilifi
Tia	Lilo
Lotomahan	Kaitu

### The future

During the next six months, the ten Falevatie will be monitored, assessed and reviewed before the next batch of toilets are constructed. This will ensure the design is to the highest possible standard. Following the assessment period the IWRM will continue further constructions. This process of review will also give the IWRM an opportunity to seek further and additional funding for more Falevatie to be constructed. After monitoring Falevatie, if there is a positive outcome, PACC project will build ten additional Falevatie.

It is the IWRM intention to continue to seek addition funding so that as many families as need them can have Falevatie in their home.

### Other Project News

Awareness raising programs have taken place with the PACC and IWRM projects informing all communities, how to better manage your water, the cause of and effect of wastewater pollution and V&A work.

Not only is the project making a difference here in Tuvalu, it is also helping other nations better understand the benefits of Falevatie.

**Compost toilets (Falevatie) are popular in Europe, but as the leading Pacific Island**

**Nation in domestic Falevatie, Tuvalu is leading the way for other island nations to replicate. Currently, other countries interested in using Falevatie include Nauru and Niue.**



The project management team is working hard to gain awareness of Tuvalu's water related issues in Tuvalu and around the world. Its first paper "Dry Sanitation Technology: The Solution", co-authored by Pisi Seleganiu, Catherine Moulogo and David Duncan, was of interest to the 5<sup>th</sup> Caribbean Environmental Forum and as such Pisi Seleganiu was invited to present at the forum in Jamaica. Here Tuvalu was represented by Mr Seleganiu in front of representatives from around the world and further support for the project was gained.

### RSC<sup>2</sup>

At the second regional steering committee for GEF-IWRM, The IWRM Tuvalu project was congratulated on its success: its awareness work with the community and its on the ground work of providing the community with much needed Falevatie. The IWRM project in Tuvalu is providing practical solutions to water related problems.

### YOU AND FALEVATIE

**IF YOU ARE INTERESTED IN HAVING A FALEVATIE IN YOUR HOME FOR FREE. ALL YOU HAVE TO DO TO APPLY IS VISIT PISI SELEGANIU AT THE IWRM OFFICE IN THE WATER DEPARTMENT OF THE PWD.**

# The Fourth Quarter 2010 IWRM Newsletter

**The last six months has seen the beginning of the IWRM project in Tuvalu make a real difference to water, sanitation and hygiene issues on Funafuti.**

## Falevatie

This quarter has seen the introduction of Falevatie in Tuvalu. Falevatie are dry sanitation technology (composting toilets), or toilets which do not use water. This is not the same as drop pit toilets, Falevatie are a new style of toilets for Tuvalu. They are clean and good for the environment.

This is not the first time that composting toilets have been introduced to Tuvalu, however, past demonstrations have been modest and only assisted a small number of

households. Under the IWRM project, the introduction of Falevatie will assist a large number of our community on Funafuti.

Falevatie have been designed by local architects and a technical team who have our community and Tuvaluan families in mind. This new design is easy to use, clean, good for the environment and will save your family a third of its water.

## **Falevatie Have arrived. Have you got yours?**

### Construction

On Funafuti, ten Falevatie have been constructed for a range of families. These families volunteered for Falevatie along with 60 others and were selected by a Selection Committee who followed strict criteria. The ten families will soon have the final piece of their Falevatie and begin enjoying the benefits of saving water and reducing pollution.

### Benefits

However it is not only these ten families who will gain from the construction of these Falevatie. You, your family, the community and the local environment will all benefit from the Falevatie.



*Dead coral caused by wastewater pollution*

By ensuring correct disposal of waste in a safe hygienic manner and not polluting the lagoon and groundwater, these Falevatie will reduce the amount of sickness in the water, helping to reduce the chances of your family getting sick. Reducing wastewater pollution will also help save the lagoon and protect the





*Ko'i e nofo ise vaenga fale peni?*

Se fale e isi sena **COMPOST TOILET**.



Tali kiei?

Charles te tama tagata ate tupu fafine ko Elizabeth kafai  
mo sui tupu o England I aso mai mua.



## Annex 7: Participatory Monitoring and Evaluation Plan

### **Participatory Planning, Monitoring, and Reporting Plan for the Tuvalu GEF Pacific IWRM Demonstration Project “Eco-sanitation Demonstration IWRM Project”**

#### 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 Tuvalu’s national IWRM demonstration project entitled: “Eco-Sanitation Demonstration IWRM Project”.

Participation and engagement of key project stakeholders including community groups and Non-Governmental Organisations [Funafuti Community], the project coordinating committee [National Water and Sanitation Steering Committee], national Lead Agency [Public Works Department, Government of Tuvalu], Cabinet, national development partners [Government of Japan, Taiwan, Australia, New Zealand etc], and global donors in project planning, monitoring, and reporting was considered important in guiding the successful implementation of the project in Tuvalu.

#### 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 [Tuvalu], 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 Tuvalu 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.

##### **STEP 2**

###### Project Monitoring



The Tuvaluan National Water and Sanitation Steering Committee (NWSSC) is the governing body of the IWRM and PACC projects in Tuvalu. This committee is compiled of government departments involved in aspects of water management. It also includes NGO's, leaders of the island councils (Kaupule) and community representatives as well as representatives of women's groups and Falevatie champions. The lead agency (Public works department) is also present at NWSSC meetings and meetings are chaired by the permanent secretary of the Ministry of Water Works and Energy.

Quarterly, the IWRM project meets the NWSSC to report on project activities, outputs shortcomings and plans. Budgeting is also discussed including quarterly expenditure and quarterly funding requests. The outputs and activities of the project are highlighted against the quarterly workplan and logframe.

As the IWRM Tuvalu project is answerable to the lead agency; the Public Works Department (PWD), monthly reporting is given to the PWD. This includes a summary of project management, expected and actual activities, financing, forecasting and progress.

The Office of the Auditor General has just been requested to compile an audit of the IWRM Tuvalu project as part of routine protocol and will ensure transparency in project financial monitoring.

### **STEP 3**

#### Project Reporting

The Tuvaluan National Water and Sanitation Steering Committee (NWSSC) is the governing body of the IWRM and PACC projects in Tuvalu. This committee is compiled of government departments involved in aspects of water management. It also includes NGO's, leaders of the island councils (Kaupule) and community representatives as well as representatives of women's groups and Falevatie champions. The lead agency (Public works department) is also present at NWSSC meetings and meetings are chaired by the permanent secretary of the Ministry of Water Works and Energy.

Quarterly, the IWRM project meets the NWSSC to report on project activities, outputs shortcomings and plans. Budgeting is also discussed including quarterly expenditure and quarterly funding requests. The outputs and activities of the project are highlighted against the quarterly workplan and logframe.

As the IWRM Tuvalu project is answerable to the lead agency; the Public Works Department (PWD), monthly reporting is given to the PWD. This includes a summary of project management, expected and actual activities, financing, forecasting and progress. All PWD reporting is sent to the Minister of Works Water and Energy who in turn, when necessary, reports to cabinet. Occasional reporting is necessary for the National Development Coordinating Committee.

Other reporting activities include a quarterly newsletter sent to all government staff (40% of employed persons on Funafuti) as well as Kaupule, NWSSC members, community leaders and posted to the outerislands and placed for the community to take as they please at newsstands. Impromptu radio announcements also keep the community informed of major project activities/outputs.

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

Year	2010				2011				2012				2013			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Community Groups [Funafuti Community]																
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	
National Coordinating Committee [National Water and Sanitation Steering 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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X





## Annex 8: Replication and Scaling-up Plan

### Tuvalu Replication Strategy 2011 - Draft

Lesson	Audience (s)	Scale	Applicability of Lesson	Replication Tools	Timeframe	Cost / Notes
<b>Community engagement</b>						
<b>Behaviour change</b>	National Government Agencies (Tuvalu and O/S)  Project Managers (NGOs, national and regional)  Outerisland facilitators	Local / National / regional		"How To" Documents  Community Engagement Report  CEF/RSC Presentation and paper	Q4 2011  Q2 2011  Annually	None
<b>Project Delivery</b>						
<b>Building Partnerships (GoT Interdepartmental / Aid project cooperation &amp; communication)</b>	Tuvalu Government Agencies (Tuvalu)  Project Managers (NGOs/ national)  Regional / Donor project managers	Of Interest??		"How To" Document	Q4 2011	none
<b>Governance</b>						
<b>National water and Sanitation Steering Committee</b>	Project Managers (NGOs/ national)  Regional / Donor project managers					
<b>Technical</b>						
<b>Construction and Maintenance of Composting Toilets</b>	Tuvalu Government Agencies (Tuvalu)  Project Managers (NGOs/ national)  Regional / Donor project managers  Community			IWP/IWRM Video  Country visit (Marshals)  "How To" manual  National Building Code  Translated "How To" manual – Tuvaluan  Translated Building Code (CT section only) – Tuvaluan	Q1 2012  Q2 2011  Q3 2011  Q1 2012  Q2 2012  Q2 2012	
<b>Capacity Development</b>	Insufficient capacity development to date					
<b>Beyond Project End</b>						
	Tuvalu Government Agencies (Tuvalu)  Project Managers (NGOs/ national)  Regional / Donor project managers			"IWRM 2" Proposal  Recommendations report for Outer Islands	Q2 2011  Q3 2011	None  None



## Annex 9: IW Pilot Project Logframe

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
1. Demonstration of innovative approaches to pig waste management on Funafuti Atoll, Tuvalu	1.1 Improved domestic pig pen operations catalysed via piloting of locally appropriate methods for on-site pig waste management	Status of conversion of the 10 percent targeted pig pens	All domestic pig pen on Funafuti atoll based on 'wash-down' waste management systems involving zero treatment of waste prior to its release into the receiving environment	Sustainable waste management a p r o c e s s demonstrated through conversion of 10 percent of nearshore wash-down pig pens to dry-litter composting systems	Consultation meeting reports, including agreements on design, site selection and roles of stakeholders  Report on assessment of the operational status [Yr 3]	Residents willing to adopt new pig waste management approaches  On-going commitment to operation of converted pig pens
1.2. Environmental and public health safeguarded via targeted reductions in nutrient and pathogen contamination of coastal areas	V o l u m e reduction in untreated pig pen effluent discharged into receiving waters	All domestic pig pen effluent is discharged directly in to receiving environment and represents a key threat to environmental and public health	Nutrient and pathogen loads from pig pen effluent directly discharging into the receiving environment reduced by 10% through demonstration of dry-litter composting systems	Comparative studies on nutrient release and reductions of pig waste systems, documents of assessments and monitoring results	Design and operation of dry litter pig pens is effective in reducing untreated effluent entering the environment  Adopted procedures for waste management and composting result in desired reductions of contaminants	
1.3 National uptake of sustainable pig waste management methods stimulated through community awareness and training	Percent increase in target population with applied understanding of sustainable pig waste management	Limited awareness of alternative sustainable pig waste management methods	Proportion of target community members with awareness of technical skills to successfully implement sustainable pig-waste management methods increased to 30% through innovative p a r t i c i p a t o r y techniques	Consultation meeting and activity reports, training workshop outputs including details of trained builders and trainers, participatory interviews	Awareness and capacity building materials are sufficiently well designed to engage community members and resource users  Continuity of participation of target audience in awareness raising events  Costs and benefits of dry litter approaches appropriate to stimulate independent uptake	

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
2. Targeted scientific approaches to optimise on-site waste management systems and to identify causal links between land-based contaminants and the degradation of coastal waters	2.1 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 Tuvalu	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 Funafuti Atoll, including dominant mechanisms, contaminant reductions and associated operating conditions	Locally appropriate design and management of eco-sanitation systems developed through targeted 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	Design and operation of eco-sanitation systems are able to be optimally improved in remote island setting  Resources are sufficiently available for reliable analysis of eco-sanitation systems to produce robust scientific results
2.2 Evidence based scaling up of dry-litter composting systems through optimal design and operation of systems to meet international standards for water safety and use of animal compost in Tuvalu	Extent of uptake of the scientific recommendations for improving dry-litter composting system designs to optimise pathogen inactivation, nutrient reduction and compost suitability	No dry-litter composting systems currently in use and efficacy at reducing contaminants is unknown in Tuvalu setting	Locally appropriate design and management of dry-litter composting 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	Design and operation of dry-litter composting systems are able to be optimally improved in remote island setting  Resources are sufficiently available for reliable analysis of dry-litter composting systems to produce robust scientific results	
2.3 Ecological health of coastal waters of Funafuti Atoll are characterised and land-based contamination processes established for key ICM planning and investment	Status of data collection for 3 priority site monitoring programmes	Lack of scientifically sound evidence for causal links between land-based contaminants and coastal water degradation	Ecosystem processes and coastal habitat monitoring programme at 3 priority sites on Funafuti to identify threats from land-based contaminants to coastal waters and causal links to algal blooms and ciguatera occurrences	Monitoring results, analysis and research reports, comparative studies and final evaluation report [Yr 3]	Untreated effluent disposal is negatively affecting coastal water quality  Resources are sufficiently available for reliable analysis and evaluation of coastal process to produce scientific results	
	Extent of the uptake of recommendations in ICM Planning			Coastal Health Summary for Policy & Planning [Yr 3]		
				Published scientific paper [Yr 3]		



Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
3. National capacity for management of waste implementation built to enable best practice in coastal waters, land and public health protection	3.1 Volunteer waste management networks are formally established towards forming an enhanced culture of environmental protection in Tuvalu	Status and effectiveness of the volunteer network  Number of trained volunteers in the network	An informal group of eco-sanitation users exists to discuss issues among owners	Network of on-site waste management owners and users with wide sectoral membership is formally operating on Funafuti for coordination, information exchange, promotion and training on waste management issues	ToR, member lists, endorsement/registration of organisation, meeting minutes, attendance records, participatory interviews, activity outputs and reports	Interest and capacity for organisation development exists  Awareness and capacity building materials are sufficiently well designed to engage community members and resource users
3.2 Increased household uptake of and donor support for on-site sanitation systems	3.2 Increased household uptake of and donor support for on-site sanitation systems	Status of reduction in cost of eco-sanitation and dry-litter systems  Number of sustainable financing options and agreement plans	High construction and transport costs are limiting wide-spread uptake of on-site waste management systems with limited funding options available	Construction and transport costs of eco-sanitation and dry-litter composting systems are reduced by 30% and financing option plans developed through community engagement processes	Cost benefit analysis, comparative studies, consultation meeting reports, refined materials and suppliers list, final analysis report	Materials are available to reduce cost of construction  Opportunities to reduce transportation costs exist
3.3 Enhanced access to effective information relating to on-site waste management issues and linkages with environmental and public health to increase awareness	3.3 Enhanced access to effective information relating to on-site waste management issues and linkages with environmental and public health to increase awareness	Total reach of media product that is syndicated  Volume of content accessed	Limited availability of effective information to stimulate understanding of waste management issues amongst target population	Innovative and locally appropriate educational, training and documentary materials about on-site waste management processes and associated environmental and public health issues, developed for public use and syndicated through school, library, CBO, public radio and online sources	Sustainable financing reports, agreements and plans  Educational films and documentaries, construction training manuals, system operational guides, compost use guidelines, radio/audio talk shows  Distribution partnership agreements	Reducing cost does not impair efficacy of optimal system operation  Resources available for awareness materials  Awareness materials will be sufficiently well designed to improve community understanding



