Integrated

Water Resource Management

Demonstration Project

Sustainable Management of Sarakata Watershed

Republic of Vanuatu

July 2007

Two views within Sarakata Watershed

Prepared on behalf of

Department of Geology, Mines and Water Resources, Vanuatu

For SOPAC, Fiji

IWRM Demonstration Project

Sustainable Management of Sarakata Watershed

Contents

A. Country Republic of Vanuatu

B. Title Sustainable Management of Sarakata Watershed

C. Executing Agency

Department of Geology Mines and Water Resources (DGMWR) will be the main executing agency, working closely with the National Water Resources Advisory committee and Sanma Water Resources Advisory Committee. DGMWR will manage the project and provide the bulk of the required ongoing technical expertise.

D. Name and Post of Government Representative Endorsing the Activity

Chris Ioan (Director)

Department of Geology Mines and Water Resources (DGMWR)

Private Mail Bag 9001, Port Vila, Vanuatu

E. Cost of Project

Total Project cost USD 9,352,227

GEF-Funding USD 516,328.00 Co-Funding USD 7,636,241

Refer to Section O for full ICA details and Annex 2 for detailed five year budget.

F. Project Summary

The Sarakata River Watershed (SRW) is located down in the central part of South Santo, and hosts a number of important watercatchments including the Luganville Municipality water catchment. The Watershed is important for subsistence farming and livelihood activities, commerce and water supply for more than 20,000 people that live in the vicinity. The watershed not only hosts the large Sarakata River that is highly prone to flooding in cyclone and rainy seasons but also a hydro scheme that is a major electricity supply for luganville.

Settlements and a variety of domestic and commercial enterprises occur within the watershed and a significant number of settlements and activities are within the proposed Luganville water supply protection zone for the existing water supply intake. These activities impact the watershed and cause water quality concerns for the main water supply for Luganville. Three other water supplies are also extracted from this watershed – Fanafo Village, Palon Community, and a private plantation owner.

The IWRM project was initiated and charged with formulating and implementing a land use management plan for the Watershed in ensuring the watershed sustainably managed from ridge to reef to meet the needs of the rural and urban population it serves and providing an exemplary national model.

G. Linkage to National Priorities and Programs

The project will enforce the Environmental Management & Conservation Act 2002 and the Water Resources Management Act 2002 for the sustainable use of natural resources and the protection and management of watersheds. The project will address ecologically sustainable development and the protection and sustainable management of water supply which are key objectives of the Priorities and Action Agenda 2006-2015 (PAA) and Comprehensive Reform Program (CRP).

The vision for Vanuatu in the PAA is "An Educated, Healthy & Wealthy Vanuatu". The Government believes that raising the welfare of the people of Vanuatu will be achieved through: higher sustainable economic growth to create jobs and raise incomes while conserving resources for future generations; ensuring macroeconomic stability to create a stable investment climate; and raising standards of service delivery particularly to rural and outer regions to improve access to basic health and primary education services while lowering costs of internal trade[i]. The main reference in the PAA to the water sector is to state as an overarching strategic priority "the provision of better basic services; especially in rural areas".

The Ministry of Lands and Natural Resources is undertaking comprehensive ministerial and departmental review and planning. The Land Summit Reform of 2006 identified key sustainable development objectives which are supported by this project. Further, the intention is that the Sarakata Watershed Management Project becomes core departmental business and does not remain a Project with a beginning and an end.

A full list of Multilateral and Regional Agreements to which Vanuatu is signatory and to which this project contributes is provided in Annex 1.

[i] Priorities and Action Agenda 2006-2015 "An Educated, Healthy & Wealthy Vanuatu" Department of Economic and Sector Planning Ministry of Finance and Economic Management June 2006

H. Linkage to IWRM and GEF Project Priority Demonstration

Within the GEF Operational Strategy for International Waters this project tackles water and environmental problems using an IWRM approach across GEF Strategic Programme III: Balancing overuse and conflicting uses of water resources in transboundary surface and groundwater basins (with a specific focus on SIDS to protect community surface and groundwater supplies while reducing sewage releases).

The geographical nature of SIDS allows IWRM approaches to rapidly demonstrate the multiple benefits of tackling water resource management in an institutionally horizontal manner, whilst applying a ridge to reef approach, tackling technical and socio-economic issues with communities and civil society at large to demonstrate equity, efficiency and environmental sustainability.

The project will also tackle, through IWRM approaches, many of the issues under GEF Strategic Programmes I and II through identifying and understanding multiple stresses on fragile coastal environments and linking these to freshwater and land management, especially upstream practices; IWRM will contribute to improving coastal fishstocks and biodiversity. IWRM approaches will also include methods to reduce economic and ecologic dead-zones of oxygen deficient water as a result of human and animal sewage waste.

The project will address land-based pollution, protection of water supply, vulnerability to climate change and prevention of land degradation. In relation to the Strategic Action Plan for the Pacific International Waters, it will include measures to reduce modification to the ecosystems, protect biodiversity and promote integrated coastal and watershed management.

I. Context and Background

The Sarakata Watershed is important for subsistence farming and livelihood activities, commerce, energy and water supply for more than 20,000 people that live in the vicinity (approximately 10% of Vanuatu's population). The watershed hosts the large Sarakata River that is highly prone to flooding in cyclone and rainy seasons. The location and boundaries of the Sarakata Watershed are shown in Figures 1, 2 and 3.

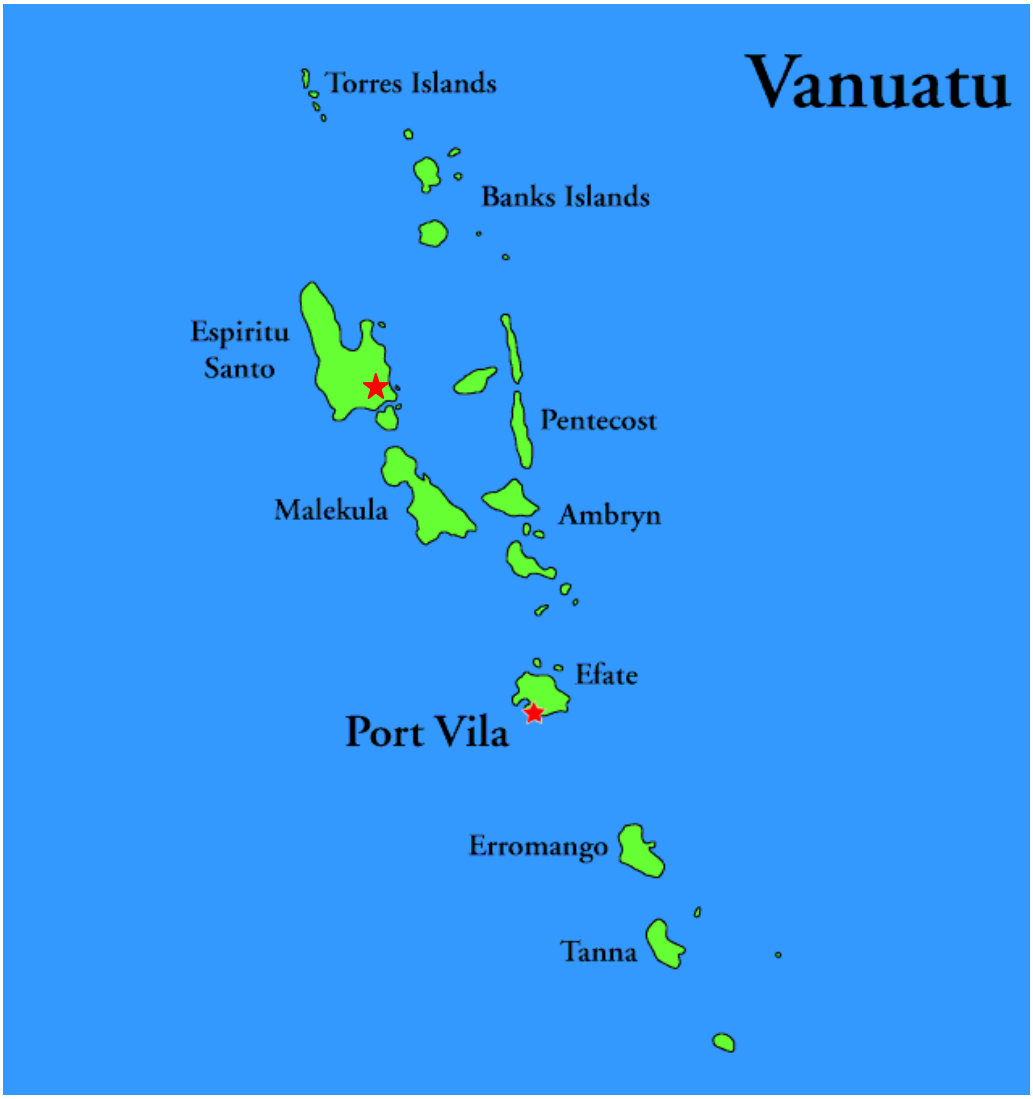


Figure 1. Map of Vanuatu with Port Vila (Capital) identified on Efate and Demonstration site (Sarakata Watershed) identified on Espiritu Santo (in red).

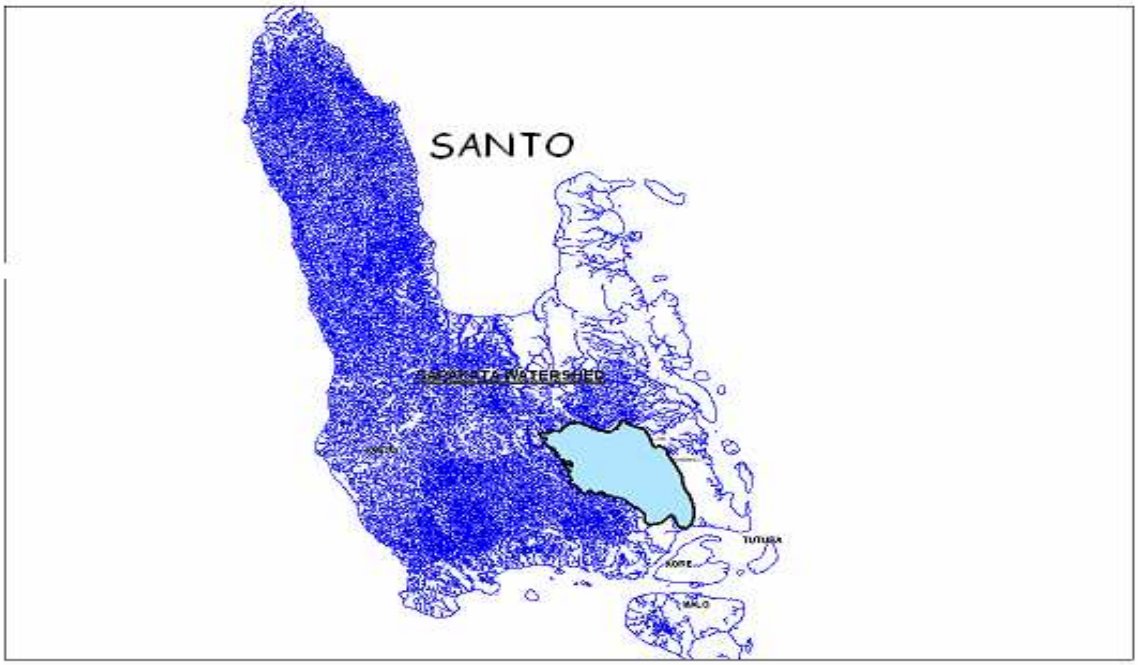


Figure 2. Location of Sarakata Watershed on Espititu Santo

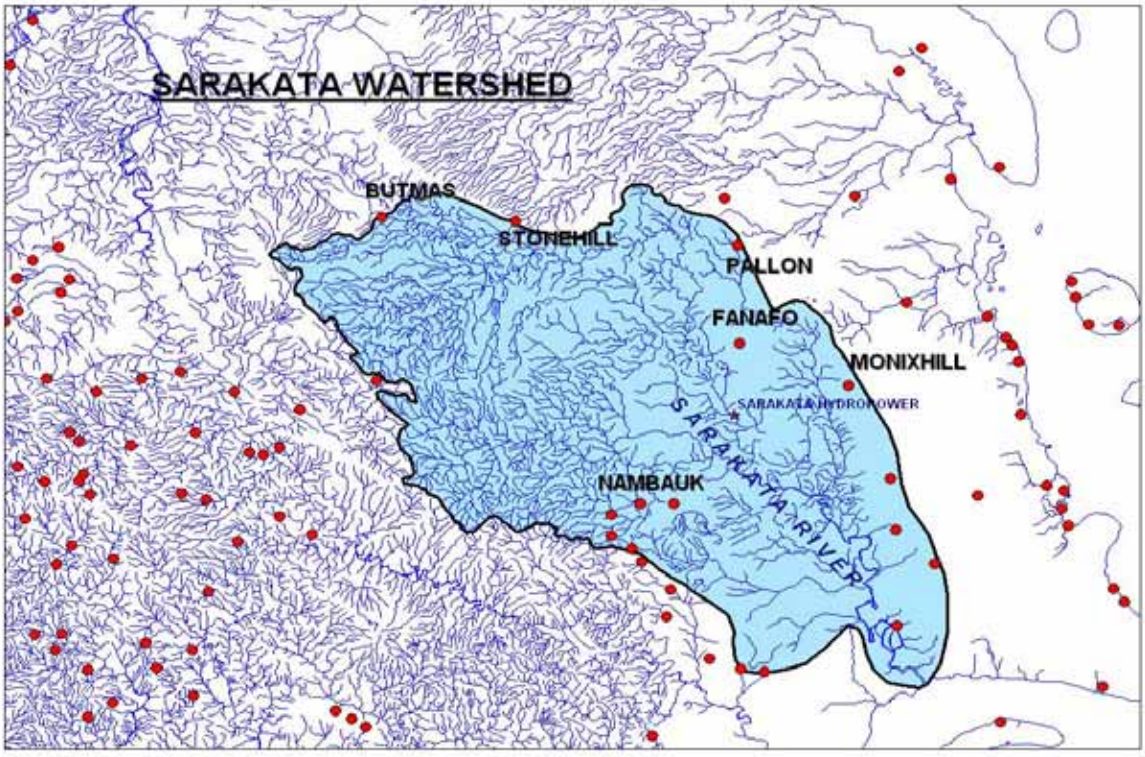


Figure 3. Detail of Sarakata Watershed (Red dots are communities)

Settlements and a variety of domestic and commercial enterprises occur within the watershed and a significant number of settlements and activities are within the Luganville water supply protection zone for the existing water supply intake. These activities impact the watershed and cause water

quality concerns for the main water supply for Luganville. Three other water supplies are also extracted from this watershed – Fanofo Village, Paton Community, and a private plantation owner. Others will be developed in future.

Settlement at the Luganville intake well

Settlement within the protection zone

Harnessing the watershed aquifer for the Luganville water supply commenced in early 1940's during WWII when American soldiers dug a two-meter diameter and four-meter deep shallow-well for water supply purposes. Ground water is about 10 meters deep at this site. This well is still used as the Luganville water supply intake.

Luganville water supply intake well

Location of proposed new Luganville water supply intake bores

The quantity and quality of water for the Luganville water supply is coming under increasing stress as a result of increasing human activities that also exacerbate natural threats (Refer Annex 5 for a full site information sheet).

Preliminary landuse planning and zoning for the protection of the Luganville water source took place in 1993 but has never been implemented. At that time residential settlements and gardens were located within the proposed protection zones and compensation issues were not resolved. Over time, settlement increased and compensation became an even bigger hurdle to implementing the protection zones. A more recent solution has been to propose relocating the Luganville water intake further upstream where ground water is deeper (20-30m) and there is less human activity. A new 55ha site has been identified for zones 1&2 to provide a more secure and safe source. Relocation does not eliminate compensation totally since compensation must be provided to the custom owners and leasehold users of the 55ha site. These negotiations are the responsibility of the Ministry of Lands and relocation has yet to be implemented.

The Sarakata River also hosts a hydro scheme being the major electricity supply for Luganville. Development of the third turbine is proposed.

Sarakata River above Hydro Scheme

Sarakata River below Hydro Scheme

Sarakata River Hydro Dam

Sarakata River Hydro Tail Race

Coastal erosion (sea wall falling away) and wreckage at the mouth of the Sarakata River

The principal concerns related to the Sarakata Watershed can be summarized as:

- Threats from agricultural and industrial pollution
- Threats from domestic and tourist (sewage and wastewater) pollution
- Inappropriate land use and poor development planning threatening the integrity of the watershed and water supply

- Lack of flood plain management
- Inadequate management and control of water extraction to ensure sustainability
- Lack of control over leakage and wastage, or inappropriate use of water resources
- Inadequate overall protection of the watershed and its ecosystem functions -particularly as a water resource

This project will be informed by lessons learnt from implementing the Tagabe Watershed Management project near Port Vila on Efate Island. The key difference between the Tagabe and Sarakata management systems is that the water supply extracted from the Tagabe aquifer is managed by a private provider UNELCO, whilst the Luganville water supply is managed by the government Public Works Department. This opportunity to learn from and compare two systems within the one country is unique and valuable.

The Government of Vanuatu understands that groundwater is finite and this valuable watershed needs urgent active management to save lives, and ensure that it can continue to provide for the needs of the people. (Refer PAA vision for Vanuatu)

J. Goal Objectives Outputs and Activities

i). Goal

Sarakata watershed sustainably managed from ridge to reef to meet the needs of the rural and urban population it serves and providing an exemplary regional model.

ii). Objectives

The main objective of the project will be to prepare an integrated Sarakata Watershed Management Plan involving the existing Sanma Provincial and National Water Resources Advisory committees and stakeholders. It will provide a model from which lessons can be learnt and best practice replicated in other watersheds.

The Sarakata Watershed Management Plan will provide an operational framework and mechanism to plan for and monitor all developments in the watershed that may affect the ecology and availability and quality of water and other resources. The main expected outcomes will be greater government and community awareness and governance, reduction in the negative water quality impacts, temporal and spatial availability of water for all uses, and mitigation of flood associated adverse effects. The specific objectives include:

1. Operative Sarakata ridge to reef watershed management plan
2. Ecology and biodiversity from ridge to reef supports & sustains wise resource use
3. Consumer water quality consistently meets WHO standards
4. Consumer water availability consistently meets WHO standards
5. Impacts of flooding mitigated
6. Watershed managed for sustainable hydro power
7. Community actively contributes to and benefits from sustainable watershed management

(See Annex 6 for Lofgrame)

iii). Outputs and Activities

1. Establish Project Management and Administration Unit

- Project manager contracted and staff appointed
- Project office established in Luganville (Sanma Provincial Council)
- Project management and monitoring systems established
- Membership and TOR of Water Resource Steering Committee (Sanma and National Water Advisory Committees) established
- Project steering committee meetings held monthly

2. Develop Sarakata Watershed Management Plan

- Participatory ecological and socio-economic surveys of Sarakata Watershed to identify ecology/biodiversity, resources and their uses and values, beliefs and attitudes to resource use, management and conservation.
- Technical surveys undertaken and data collated for water resource assessment.
- Prepare watershed landuse and resource maps (using existing VANRIS mapping system)
- Identify core use and values of the resources and watershed, specifically significant local resource uses.
- Identify management strategies for the entire watershed and specific ecosystems and resource use.

- Identify policies and plans including: compensation[ii], water extraction, custom use rights, riparian zones etc
- Identify monitoring, evaluation, reflection and learning strategies and implement.

3. Implement Sarakata Watershed Management Plan

Key outputs and activities of plan implementation include:

a. Ecology and biodiversity from ridge to reef supports and sustains wise resource use

- Implement commercial and domestic farming and agriculture management best practices to meet local and national needs.
- Manage de-forestation and promote re-forestation to protect watershed and provide for future resource use.
- Promote alternative land uses to meet management strategies
- Implemenet coastal management practices to manage erosion and protect coastal reefs from siltation and pollution.
- Implement appropriate community resource use agreements eg custom use of resources.
- Establish protected areas with community management systems.

b. Deliver safe and secure water to consumers (in four existing water supply systems within the watershed plus any new supplies developed – Luganville, Fanafo, Palon, Russell Donovan, other(s))

- Relocate Luganville water supply intake (includes bores, pump, storage tanks, pipes) to new approved site.
- Fence Luganville water supply source at new intake site.
- Develop and implement Water Safety Plans (including integrated water monitoring system) for all water supply systems within the watershed.
- Develop demand management programs and mechanisms for efficient water delivery.
- Implement apporpiatye sanitation and waste management learning from the Tagabe River eco-sanitation model.
- Establish ground & surface water quality monitoring programs as required under the Water Resources Act by DGMWR.

[ii] Compensation being for activities such as land use for new Luganville water supply intake

c. Mitigate flooding

- Preliminary flood mapping on topographical maps for planning purposes.
- Improve existing flood monitoring system (update and install telemetric rain gauges and water level recording stations)
- Develop & implement guidelines for best land use practice and flood mitigation in flood prone areas.
- Establish active flood warning and response systems including education and awareness.

d. Manage watershed for sustainable hydro power

- Manage and upgrade existing hydro scheme including land stabilising and environmental protection.

e. Develop and implement policy and regulations

- Gazette and implement Luganville Water Protection Zone and other protection zones within the watershed as required.
- Establish and effectively implement policies and procedures to enact Resource Management and Water Resource Legislation and Sarakata Watershed Management Plan.
- Develop land lease policies (including compensation policy and delivery where necessary e.g. for land required for new Luganville water intake.)
- Local resource use policy and plans (including custom use of resources and ownership of land)
- Effective communication strategies in place to communicate project and policy level issues to all stakeholders.
- Develop an effective Enforcement Unit to ensure policies and practices are implemented and adhered to.

f. Community actively contribute to sustainable watershed management – co-funding projects contributing to community development include:

- River Care
- Water Safety Plans
- Building Sustainable Futures (Community watershed groups and funds)

- Waste Management
- Community development training
- Water committee training
- Plumbers training

g. Implement monitoring, evaluation, reflection and learning by all stakeholders:

- Monitoring within the project by stakeholders e.g. DGMWR, NGOs and communities.
- Monitoring of the project by DGMWR to meet national and GEF requirements.

Overarching Institutional Capacity Building Requirements to be funded by GEF Regional Component or EU IWRM National Planning Program (as well as in day-to-day implementation of IWRM)

- PWD
  - √ Provide reliable and up-to-date supply and demand data
  - √ Monitor water quality within Luganville water supply system
  - √ Implement leak detection programs
  - √ Ensure consistent quantity of water delivery
  - √ Implement Luganville Water Safety Plan
  - √ Liaise / communicate with all stakeholders (including other government departments)

- DGMWR (water resource unit)
  - √ Prepare monitoring plans and reports
  - √ Develop regulations, polices and plans to implement the Water Resource Management Act 2002
  - √ Liaise / communicate with all stakeholders (including other government departments)

- Sanma Water Resource Advisory Committee

- √ Prepare Water Safety Plans for all water supply systems within the Sarakata Watershed
- √ Prepare Watershed Management Plans
- √ Liaise / communicate with all stakeholders (including community, other government departments and NGOs)

- National Water Resource Advisory Committee
  - √ Prepare Watershed Management Plans
  - √ Liaise / communicate with all stakeholders (including other government departments)

iv). Baseline and Alternative Scenario Activities

Explanation of National (Baseline) and Regional (Alternative) Project components are identified below.

Output	Activity	Benefits		Explanation
		National	Regional	
1. Project Management Unit Established	1.1 Project manager contracted and staff appointed		x	Project Manager will only be appointed to coordinate all the alternative components – otherwise it would be done in-house. Other project staff will come from in-house.
	1.2 Project offices established		x	Project Offices will be established virtually on site to ensure coordination of all components
	1.3 Project management and monitoring systems established		x	Project management and monitoring systems could be replicated in other PICs
	1.4 Membership and TOR of Steering Committee established	X		Review of water committee membership & TOR already part of National Water Strategy
	1.5 Project Steering Committee meetings	X		Existing Sanma Water Advisory Committee meets quarterly and will probably take on the role of Project Steering Committee responsibilities
2. Sarakata Watershed Management Plan	2.1 Participatory ecological and socio-economic surveys		x	Surveys are required to understand existing situation and prepare full watershed management plan. They will build on data from completed biodiversity & behavior & beliefs surveys already completed. Methodology and lessons learnt may be applied regionally & may also use regional lessons in

Output	Activity	Benefits		Explanation
		National	Regional	
				developing methodology
	2.2 Technical surveys undertaken and data collated		x	Provides necessary data for water resource management – survey methods and data may be shared regionally
	2.3 Prepare watershed land use maps using VANRIS		x	Vanuatu Resource Information System (VANRIS) is an excellent land use mapping method but currently contains no water resource data. Information from the ecological, socio-economic & technical surveys will be included in the VANRIS data. Methods may be applied regionally.
	2.4 Identify core values and uses		x	Identifying core values and uses is necessary before determining management strategies, policies and plans and is part of the IWRM strategy for the watershed. Lessons may be learnt and applied regionally.
	2.4 Identify management strategies		x	Management strategies for dealing with land use issues may be shared regionally.
	2.5 Identify policies & plans		x	Policies & plans may have regional application
	2.6 Identify monitoring, evaluation, reflection & learning strategies		x	Reflection and lessons learnt may be shared with other regional agencies working in sustainable watershed management.
3. Ecology and biodiversity from Ridge to Reef support and sustain wise resource use	3.1 Implement commercial & domestic farming & agriculture management practices		x	The combination of subsistence and commercial farming within the watershed is found in other PICs. There are opportunities to use and share lessons regionally.
	3.2 Manage de-forestation and promote re-forestation		x	Managing deforestation and reforestation have regional benefits and lessons. Also benefits to climate change and international

Output	Activity	Benefits		Explanation
		National	Regional	
				waters by improving ecology & water quality.
	3.3 Promote alternative land uses		x	Alternative land use practices have regional applications and benefits
	3.4 Coastal management practices		x	Opportunity to share regional lessons and positively influence coastal ecology into international waters
	3.5 Community resource use agreements eg custom use		x	Lessons and indigenous people's agreements can be shared regionally.
	3.6 Establish protected areas		x	All protected areas support biodiversity and provide regional benefits
4. Deliver safe and secure water to consumers - Luganville; Fanofo; Palon; Russell Donovan; Other	4.1 Relocate Luganville water supply intake	x		This includes new bores, pumps, storage tanks and pipes. Necessary to provide a safe & secure water supply – responsibility of Vanuatu Government
	4.2 Fence Luganville water source	x		Provides local water security by excluding unwanted activity from protected zones 1&2.
	4.3 Develop Water Safety Plans for all water supplies		x	Concepts & outcomes for Water Safety Plan can be shared regionally
	4.4 Demand management programs and mechanisms		x	Methods & outcomes for demand management mechanisms may be shared regionally
	4.5 Sanitation & waste management		x	Sanitation & waste management practices to replace pit toilets have regional application & will result in improved water quality.

Output	Activity	Benefits		Explanation
		National	Regional	
	4.6 Establish ground & surface water quality monitoring programs	x		Government responsibility although methods & outcomes shared regionally
5. Mitigate Flooding	5.1 Preliminary flood mapping on top maps		x	Methods & outcomes shared regionally
	5.2 Upgrade telemetric monitoring system		x	Improves / provides necessary local flood management data
	5.3 Develop & implement guidelines for flood mitigation		x	Guidelines include best land practices, prevention, awareness etc.
	5.4 Establish active flood warning system including awareness and education		x	Methods for flood warning can be shared regionally. Reducing impact of flooding has regional economic benefits.
6. Provide for sustainable hydro power	6.1 Manage and upgrade existing hydro scheme. Install third turbine, land stabilisation , environmental proection & management.		x	Sustainable hydro power reduces Vanuatu's contributions to carbon emitions (less reliance on diesel fuel for electricity supply) and has positive regional benefits. Sustainable management of the watershed to enable hydro alongside a variety of other uses requires an integrated water resource management approach.
7. Develop & implement policy & regulations	7.1 Gazette & implement water protection zones	x		National policy – Government responsibility
	7.2 Establish & implement resource management legislation & Sarakata Watershed management plan		x	All aspects can be shared regionally
	7.3 Compensation policy & delivery	x		Compensation for land (e.g. for water intake) is a national responsibility yet policies can be shared regionally

Output	Activity	Benefits		Explanation
		National	Regional	
	7.4 Local resource use policy & plans		x	Methods & outcomes shared regionally
	7.5 Effective communication strategies in place		x	Includes regional communication with "communities of practice" working on similar issues
	7.6 Develop an effective enforcement unit		x	Vanuatu government responsibilities although methods may be shared and applied regionally
8. Community actively contribute to watershed management	8.1 River Care awareness		x	This is a regional education program delivered through schools
	8.2 Water Safety Plans & community awareness		x	This is a regional program delivering health and environmental awareness education
	8.3 Building sustainable futures community education		x	This is a regional education program
	8.4 Waste Management - national education & awareness		x	This is a regional education program
	8.5 Community development training for all water supply systems	x		Community training given by Vanuatu Government during installation of every water supply. Methods and outcomes may be shared regionally
	8.6 Water Committee Training for all water supply systems	x		Water committee training delivered by Vanuatu Government to all water committees – improves sustainability & builds capacity of community to manage & maintain supply
	8.7 Plumbers Training for all communities	x		Plumber training delivered by Vanuatu Government in all provinces contributes to sustainability of water supplies by building local capacity in monitoring & maintenance

Output	Activity	Benefits		Explanation
		National	Regional	
9. Monitoring, evaluation, reflection and learning by all stakeholders	9.1 Various monitoring & evaluation components described above & undertaken by stakeholders within the Project		x	Monitoring, reflection & learning critical to continuous improvement. Monitoring methods,data & lessons learnt shared for regional learning & application
	9.2 Monitoring & evaluation of Project activities		x	National responsibility yet only required as part of the IWRM project.

v). End of Project Landscape

At the end of the project, the Sarakata Watershed will have been transformed from an ad hoc managed watershed into a planned resource management area where human activity (e.g. custom resource use, water abstraction, hydro scheme) is carefully controlled and where ground and surface water are actively protected against contamination and harmful use. Management of the water resource in the watershed will be integrated into improved quality and management of demand and more efficient supply and distribution. Impacts of flooding will be mitigated by a flood prevention, warning and response system.

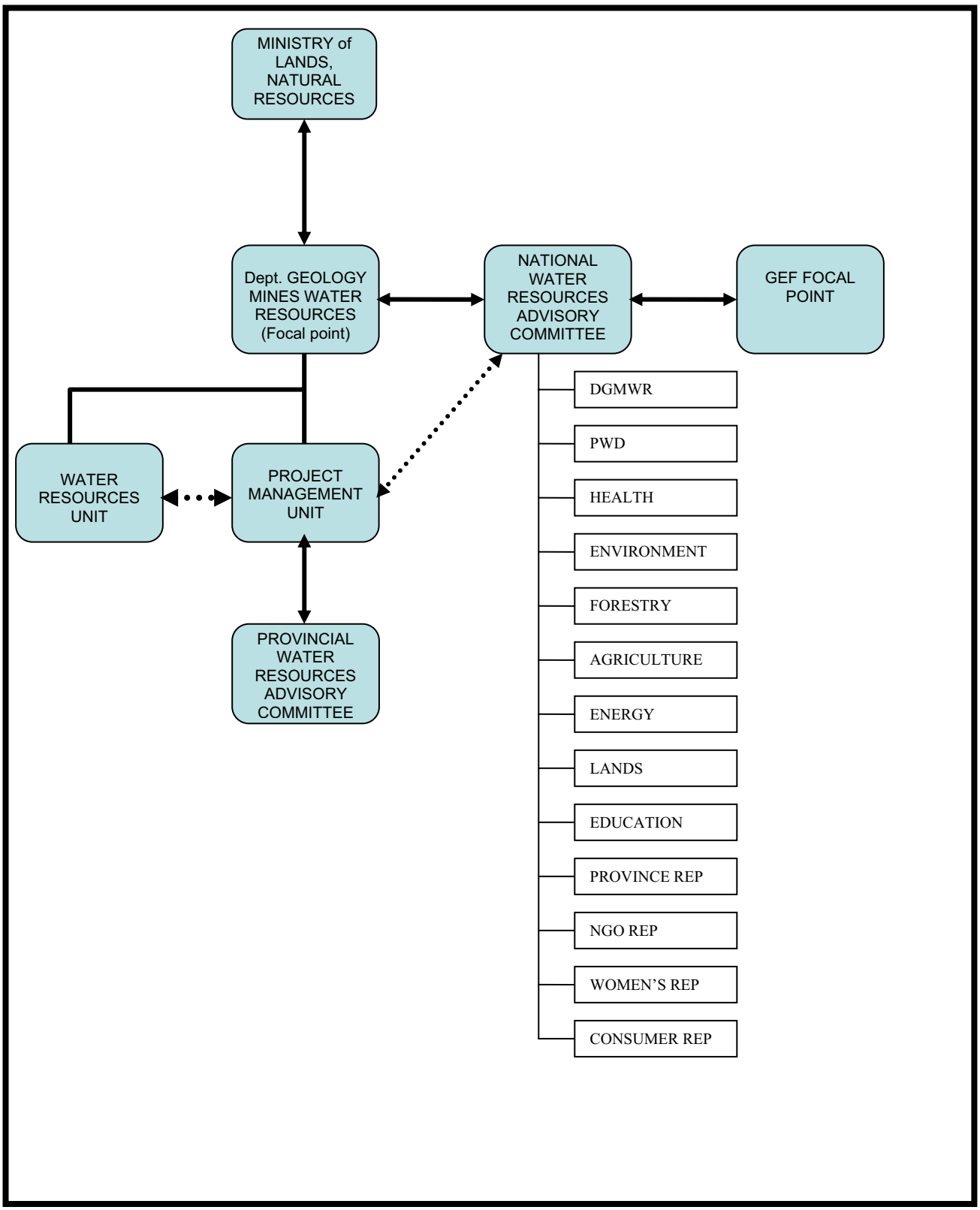
Indicators Present

- Operative Sanma water advisory committee
- Community contributions to sustainable management
- Sustainable land use practices in place
- Operative Sarakata Watershed Management Plan
- Supportive policies and procedures in place and actioned
- Luganville water source relocated and protected
- Upgraded hydro scheme and environmental protection actions
- Water supply quality meets WHO standards
- Water supply quantity meets WHO standards
- Operative Water Safety Plans in place for all water supplies within the Watershed
- Enforcement Unit established
- Lessons learnt clearly identified and articulated

K. Project Management Structure and Accountability

A Project Management Unit (PMU) will be established under the Department of Geology, Mines and Water Resources. The PMU will comprise the IWRM Focal Point and a designated Project Manager assigned exclusively to this project. It is anticipated the Project Manager will be located in Luganville with office provided by Sanma Provincial Government.

The Project Manager will be a member of the Sanma Water Resource Advisory Committee which will be an advisory body to the PMU. The Sanma Water Advisory Committee will also be represented on the National Water Advisory Committee.


MINISTRY of LANDS, NATURAL RESOURCES
Dept. GEOLOGY MINES WATER RESOURCES (Focal point)
NATIONAL WATER RESOURCES ADVISORY COMMITTEE
GEF FOCAL POINT
WATER RESOURCES UNIT
PROJECT MANAGEMENT UNIT
PROVINCIAL WATER RESOURCES ADVISORY COMMITTEE
DGMWR
PWD
HEALTH
ENVIRONMENT
FORESTRY
AGRICULTURE
ENERGY
LANDS
EDUCATION
PROVINCE REP
NGO REP
WOMEN'S REP
CONSUMER REP

L. Stakeholders and Beneficiaries and their Contributions

Various government departments and institutions will be involved in an integrated and multisectoral approach to the development and implementation of the objectives and deliverables of this demonstration project. They include:

- Ministry of Lands and Natural Resources (Department of Geology, Mines & Water Resources (DGMWR); Environment Unit; Energy Unit, Department of Lands)
- Ministry of Agriculture, Quarantine, Livestock, Forestry and Fisheries (Department of Quarantine & Livestock; Department of Forestry; Department of Agriculture; Department of Fisheries)
- Ministry of Health
- Ministry of Education
- Ministry of Internal Affairs (Luganville Municipality; Sanma Provincial Government)
- Ministry of Infrastructure and Public Utilities (Public Works Department (PWD); Ports and Harbours; Meteorological Service).

Non-government stakeholders will also be intimately involved to capture knowledge and expertise, to explore new and innovative ideas and options, to foster support for the overall process, and to actively contribute to the implementation of a shared vision for the Sarakata Watershed. These will include:

- Live and learn (NGO)
- Wan Smol Bag (NGO)
- Wan Tok (NGO)
- Vanuatu Rural Development Training Centres (VRDTC)
- Communities
- UNELCO (private sector water provider with existing water testing laboratory)

M. Sustainability

The intention of long-term ridge-to-reef planning for the Sarakata Watershed is to completely integrate cross-sectoral principles and stakeholder contributions to establish sustainable futures for local communities. In fragile island environments such as Vanuatu where management resources are

limited a more integrated synergistic approach will leverage resources and increase opportunities for efficient processes, spark new insights, and develop sustainable outcomes.

A major component of the demonstration model will be to evoke a paradigm shift in all stakeholders to understand the connected systemic quality of nature (including ecological and human social, economic and political systems). This connection will be mirrored in the (integrated) management system. The project will explore practices and the efficacy of management options and showcase a group of people working collectively toward a shared vision.

Other PICs and SIDS may find the methods and practices useful in developing integrated watershed management options for their own countries.

Sustainability will ultimately depend on this Project becoming core business for participating government and other stakeholder groups. The outputs and activities fit well within the Vanuatu Priorities and Action Agenda, the Land Summit recommendations of 2006 and the National Water Strategy currently being developed.

N. Replication

In the national context, the Sarakata Watershed Management demonstration project would be easily replicated in two other key Vanuatu watersheds providing urban water supplies - Lakatoro and Isangel watersheds in Malekula and Tanna islands respectively.

The regional environmental benefits from developing such a model would be in its replication within other relevant Pacific Island Countries. The adoption of effective models for aquifer protection and sustainable management should result in a marked regional improvement in watershed environmental quality, supported by communities and stakeholders who recognise improvements within their own quality of life as a result of these initiatives. It is intended that lessons and best practices from this model and from the demonstration approach as a whole could be transferred globally to other Small Island Developing States (SIDS) (and non-SIDS) situations as relevant.

O. Monitoring, Evaluation, Reflection and Learning

There are two aspects to monitoring, evaluation, reflection and learning. The first occurs with stakeholders as an integral part of the Project itself. The second is monitoring the progress of the Project by the project implementing and executing agencies.

i) As part of encouraging awareness at the grass-roots level, monitoring programmes would be co-operatively developed with local communities and schools and the several relevant government agencies and NGOs. The need for the monitoring process would be explained and communities and schools trained in sampling and observation. This would provide a link and explanation to the overall management and policy process as well as any legislative requirements. In this manner all stakeholders – government, non-government, communities and schools would be informed and directly involved in creating and steering the management requirements and the decision-making process.

ii) Project managers will establish an excellent financial management and implementation monitoring system. They will also be encouraged to regularly reflect on their progress and learning as the project develops.

P. Cost and Co-funding

Table 1 provides project components identifying their respective baseline and incremental costs and full alternative budget. The total project cost is USD 9,220,124.00 for five years. A detailed budget breakdown is provided in Annex 2 and work plan in Annex 3.

Table 1 Incremental Costing Result (US$)

Project Component	Baseline Scenario	Alternative Scenario	Incremental Costing (B-A)	
			GEF	Co-Funding
1	40,458.83	248,385.83	149,338	58,589
2	115,185.26	136,044.26	13,275	7,584
3	0	120,913	101,266	19,647
4	211,797.89	364,659.89	42,715	110,147
5	0	38,875	10,079	28,796
6	0	7,100,000	0	7,100,000
7	769,821.46	1,096,297.46	191,976	134,500
8	62,392.02	239,373.02	0	176,981
9	0	7,679	7,679	0

Total USD	**A** **1,199,655.46**	**B** **9,352,227.46**	**516,328**	**7,636,244**

Co-funding sources include:

- National & Provincial Government
- Live & Learn RiverCare; Waste Management Education; Building a Sustainable Futures; Strengthening the Capacity of Chiefs, Land Owners and Local Councils to Safeguard Rainforest Resources in Vanuatu
- Regional Water Safety Plan program
- Regional Water Quality program
- Pacific HYCOS project
- JICA

All co-funding projects are detailed in Annex 4. The budgets provided are for National Programs. The full budget has been apportioned to IWRM within the detailed budget.

Annex 1 Multilateral and Regional Agreements to which Vanuatu is signatory

Environment Unit		
Convention on International Trade in Endangered Species of Wild Fauna and Flora	Commits Vanuatu to regulate trade in species listed by parties to the Convention.	Ratified 1989
Convention on Biological Diversity		Ratified 1995
Framework Convention on Climate Change (Ratification)		Ratified 1993
Montreal Protocol on Substances that Deplete the Ozone Layer (Ratification).		Ratified 1994
Vienna Convention for the Protection of the Ozone layer.		Ratified 1994
Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP Convention)	A comprehensive legal framework for the protection, management and development of the marine and coastal environments and natural resources of the South Pacific Region	Signed
Convention on Conservation of Nature in the South Pacific (Apia Convention)	A regional legal framework for the protection of nature including conservation and management of protected areas and conservation areas.	Ratified 1994
South Pacific Nuclear Free Zone Treaty (Ratification)		Ratified 1995
Treaty on the Non-Proliferation of Nuclear Weapons (Ratification)		Ratified 1995
United Nations Convention for Combatting Desertification (UNCCD)	A multilateral framework aimed at combating desertification and other forms of land degradation and promoting sustainable land management	Ratified 1999
Waigani Convention	Bans the importation into forum Island Countries of hazardous wastes and radioactive wastes and controls the trans-boundary movement and management of wastes within the South Pacific Region.	Signed.
Department of Forestry		
International Tropical Timber	The aim of the International Tropical	Acceded to ITTA

Agreement	Timber Agreement is to provide a framework for consultation among producer and consumer member countries on all aspects of the world tropical timber trade. Among its multiple objectives is a commitment to assist members to meet ITTO's Year 2000 Objective, which states that by the year 2000 all tropical timber products traded internationally by Member States shall originate from sustainably managed forests.	in 2002
Department of Fisheries		
Convention on the Conservation and Management of Highly Migratory Fish stocks in the Western and Central Pacific Ocean	Provides for international cooperation to manage sustainably highly migratory commercial fish stocks in the South Pacific.	Before Government
United Nations Convention on Law of the Sea (LOS)	Regulates all ocean areas, all uses of the seas and all of its resources. Includes provisions relating to navigational rights, territorial sea limits, economic jurisdiction, legal status of resources on the seabed beyond the limits of national jurisdiction, passage of ships through narrow straits, conservation and management of living marine resources, protection of the marine environment, a marine research regime and a binding procedure for settlement of disputes between States.	August 1999
LOS Provisions relating to relating to the conservation and management of straddling fish stocks and highly migratory fish stocks.	Provides for the conservation and management of highly migratory fish stocks including tuna, swordfish,…	Signed but not ratified
Convention on the Prohibition of Fishing with Long Drift Nets in the South Pacific	Bans the use of Long Drift Nets by fishing boats.	Ratified 1991
Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region (Ratification) Act No 10 of 1993.	Provides for Cooperation in Fisheries Surveillance in the South pacific Region.	Ratified 1995
Vanuatu Quarantine and Inspection Services		

Plant Protection Agreement for the South East Asia and the Pacific	Aims to prevent the introduction and spread of destructive plant diseases and pests within the Asia Pacific Region by setting up a Plant Protection Commission, and regulating trade in plants and plant products.	Ratified 1997
Stockholm Convention on Persistent Organic Pollutants.	Controls and eliminates production and use of certain persistent organic pollutants.	Signed 2002, not yet ratified.
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in international trade	Prevents problems with hazardous chemicals by impeding exports of unwanted chemicals to countries that cannot manage them throughout their life cycle.	Signed not yet ratified
Department of Agriculture and Rural Development		
Focal Point for the Food and Agriculture Organisation.	The FAO is the leading multilateral organisation with a mandate to raise levels of nutrition and standards of living, to improve agricultural productivity and to better the conditions of rural populations.	
Department of Meteorology		
Member of the World Meteorological Organisation	The World Meteorological Organisation maintains the World Weather Watch and provides a mechanism for global cooperation in weather forecasting.	
Ports and Marine		
International Convention for the Prevention of Pollution of the Sea by Oil		Ratified 1983
International Convention on Civil Liability for Oil Pollution Damage		Ratified 1983
International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage		Ratified 1989
Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships		Ratified 1989

Vanuatu Cultural Centre		
World Heritage Convention	Affords international recognition of the need to manage and conserve internationally significant elements of the living, built and cultural environment.	Ratified May 2002

Annex 2 Budget Details

Output	Budget Item	Description of Expenditure	Benefits		USD	USD	USD			USD
							Co-funding			
			Natl	Regl	Baseline	GEF	In-kind	Funds	Donor	Alternative
1a. Project Management Unit Established	1.1 Project manager & staff appointed	PM 60 mths @ 150,000 Vt/mth		x		86,389				**86,388.94**
		Accommodation for PM 60 mths @ 40,000 vt /mth				23,037				**23,037.05**
	1.2 Project offices provided in Sanma Province	**Administration including:**								
		Office rental 60 mths @ 15000vt/mth					8,639		DGMWR/Govt	**8,638.89**
		Communication 60 mths @ 20,000vt/mth		x		11,519				**11,518.53**
		Utilities electricity, water 60 mths @ 15,000vt/mth				8,639				**8,638.89**
		Office equipment - PC, printer, software, 1 lap top				5,279				**5,279.32**
		Stationery @ 10000/mth				5,759				**5,759.26**

	1.3 Membership / TOR of Water Resource Steering Committees established	Membership reviewed - 3 meetings @ 5000 Vt / meeting	x		143.98				NZAID	**143.98**
	1.4 Project management and monitoring systems established	2x workshops @ 20000 vt / w/s		x		384				**383.95**
		1 Digital camera @ 100000 vt 1 DVD @ 100000 vt				1,920				**1,919.75**
	1.5 Project Steering Committee meetings - NWAC & SWAC	PM travel to 4 NWAC meetings/yr @ 30000vt	x			5,759				**5,759.26**
		Subsistence for PM 2dx4=8d/y				653				**652.72**
		4 National Water Committee meetings /yr @5000vt			959.88				Govt	**959.88**
		4 Sanma Water Committee meetings /yr @ 5000vt			959.88				Govt	**959.88**
1b Government contributions	Salaries	4 staff 3d/mth = 144d/yr for 5yrs	x				31,820		Govt	**31,819.93**
	subsistence	144d/yr @1700					11,749		Govt	**11,748.90**
	Office	Department office space @ 10,000vt/mth					5,759		Govt	**5,759.26**
	Communication	phone, email					622		Govt	**622.00**

	Equipment	Vehilce in Santo			38,395.09				Govt	**38,395.09**
Subtotal 1					**40,458.82**	**149,338**	**58,589**	**0**		**248,385.49**
2. Sarakata Watershed Management Plan	2.1 Participatory ecological and socio-economic surveys	6 x 5-day PRA surveys @ 100000 vt /survey		x		5,759			Govt	**5,759.26**
		Travel 3 people x 6 surveys @ 30000 vt / person				5,183			Govt	**5,183.34**
		Subsistence for 3 people (6 surveys @ 5d ea @ 1700vt/d				1,469			Govt	**1,468.61**
		Data processing & Preparation of report				480	192		Govt	**671.91**
	2.2 Technical surveys (some in support of upgraded hydro)	Land stability, hydrology, biodiversity	x		115,185.26				Gov / Energy	**115,185.26**
	2.2 Prepare watershed land use maps using VANRIS	Data procesing & Preparation of maps		x			960	1,920	Govt	**2,879.63**
	2.3 Identify core values and uses	2 x workshops @ 20000 vt				384				**383.95**
		Travel 3 people x 2 @ 30000vt						3,456	Govt	**3,455.56**
		Prepare report @ 10000 vt						96	Govt	**95.99**

	2.4 Identify management strategies	Planning strategies & mechanisms		x			192		Govt	**191.98**
	2.5 Identify policies & plans			x			480		Govt	**479.94**
	2.6 Identify monitoring, evaluation, reflection & learning strategies			x			288		Govt	**287.96**
Subtotal 2					**115,185.26**	**13,275**	**2,112**	**5,471**		**136,043.39**
3. Protect ecology and biodiversity from Ridge to Reef	3.1 Implement commercial & domestic farming & agriculture management practices	Train communities - sustainable farming practices, improved fallow, soil erosion control, organic fertiliser		x		7,679		4,912		**12,590.52**
	3.2 Manage de-forestation; promote re-forestation	De-forestation for cattle ranching - re-forestation, awareness		x		6,239		9,823		**16,062.20**
	3.3 Promote alternative land uses	Finding new land uses eg water intensive taro, promoting land uses that reduce impact on water quality, ecology & biodiversity		x		5,759		4,912		**10,670.76**
	3.4 Coastal management practices	Raise awaremess in coastal management, erosion control, waste management		x		28,796				**28,796.31**

	3.5 Community resource use agreements	Custom uses need to be identified and allowed for according to custom & law		x		14,398				**14,398.16**
	3.6 Establish Protected Areas	Ecological surveys, Identify locations, Community consultation & awareness, management strategies		x		38,395				**38,395.09**
Subtotal 3					**0.00**	**101,267**	**0**	**19,646**		**120,913.04**
4. Deliver safe and secure water to consumers - Luganville; Fanofo; Palon; Russell Donovan; Other	4.1 Relocate Luganville water supply intake	Complete drilling new bores	x		26,928.93				Gov	**26,928.93**
		Build new storage tank			33,595.70				Gov	**33,595.70**
		Purchase & install new pipe line			105,586.48				PWD/CK	**105,586.48**
		Purchase & install new pump			2,503.82				Gov	**2,503.82**
	4.2 Fence Luganville source	Fencing materials	x			9,599				**9,598.77**
	4.3 Develop WSP for all Water supplies	Train Trainer workshop, 2 x planning w/s		x				29,099	AUSAID /Govt	**29,098.68**
	4.4 Improved Sanitation & waste management	Pit toilets prevalent - introduce compost or similar along with waste management		x		33,116				**33,115.76**

	4.5 Demand management mechanisms	Repair pipes, leak detection to be actioned		x	38,395.09			**63,050**	PWD / SOPAC	**101,445.09**
	4.6 Establish water quality monitoring programs		x		4,787.87				Govt / NZAID	**4,787.87**
	4.7 Water quality monitoring capacity building for PICs			x				17,998	NZAID	**17,997.70**
Subtotal 4					**211,797.89**	**42,715**	**0**	**110,146**		**364,658.79**
5. Mitigate Flooding	5.1 Preliminary flood mapping on topo maps	production of flood mapping on topo maps		x		2,400				**2,399.69**
	5.2 Upgrade telemetric montitoring system	Equipment, installation, monitoring, travel		x				28,796	HYCOS	**28,796.31**
	5.3 Guidelines for flood mitigation	Planning mechanisms for flood mitigation		x		4,799			Govt	**4,799.39**
	5.4 Establish active flood warning & awareness system			x		2,880				**2,879.63**
Subtotal 5					**0.00**	**10,079**		**28,796**		**38,875.02**
6. Provide for sustainable hydro power	Installing third turbine - Energy Unit			x				7,100,000	JICA	**7,100,000.00**
Subtotal 6					**0.00**	**0**	**0**	**7,100,000**		**7,100,000.00**

7. Develop & implement policy & regulations	7.1 Gazette & implement water protection zones		x		1,919.75			2,400	Govt	**4,319.45**
	7.2 Establish & implement resource management legistaion & Sarakata Watershed management plan			x		95,988		33,025	NZAID	**129,012.71**
	7.3 Compensation policy & delivery		x		767,901.71			33,025	NZAID	**800,926.71**
	7.4 Local resource use policy & plans			x		47,994		33,025	NZAID	**81,018.86**
	7.5 Develop effective enforcement system					47,994		33,025	NZAID	**81,018.86**
Subtotal 7					**769,821.46**	**191,975**	**0**	**134,500**		**1,096,296.58**
8. Community actively construbute to watershed management	8.1 River Care awareness	Regional education & awareness program		x			36,000	5,790	Live and Learn	**41,790.00**
	8.2 Water Safety Plans community awareness	Regional education & awareness program to improve safety of water supply		x			2,470	13,330	Live and Learn	**15,800.00**
	8.3 Building sustainable futures	Community Education		x				47,400	Live and Learn	**47,400.00**

	8.4 Community development training	Training given by DGMWR during design, development & installation of all water supplies	x					71,991	Gov / NZAID	**71,990.79**
	8.5 Water Committee Training	Financial management training for all water committees	x		57,592.63				Gov / NZAID	**57,592.63**
	8.6 Plumbers Training	Community training in water supply maintenance	x		4,799.39				Gov / NZAID	**4,799.39**
Subtotal 8					**62,392.01**	**0**	**38,470**	**138,511**		**239,372.80**
9. Monitoring, evaluation, reflection and learning by all stakeholders	9.1 Monitoring & evaluation undertaken by stakeholders within the Project			x		5,759				**5,759.26**
	9.2 Monitoring & evaluation of Project activities			x		1,920				**1,919.75**
Subtotal 9					**0.00**	**7,679**	**0**	**0**		**7,679.02**
Total USD					**1,199,655.44**	**516,328**	**99,171**	**7,537,070**		**9,352,224.13**

Annex 3 Demonstration Work Plan

Outputs	Activity	Year 1				Year 2				Year 3				Year 4	Year 5
		1	2	3	4	1	2	3	4	1	2	3	4		
1. Project Management Unit Established	1.1 Project manager and staff contracted														
	1.2 Project offices established														
	1.3 Membership and TOR of Water Resource Steering Committee established														
	1.4 Project management and monitoring systems established														
	1.5 Project Steering Committee meetings														
2. Sarakata Watershed Management Plan	2.1 Participatory ecological and socio-economic survey														
	2.2 Prepare watershed land use maps using VANRIS														
	2.3 Identify core values and uses														
	2.4 Identify management strategies														

Outputs	Activity	Year 1	Year 2	Year 3	Year 4	Year 5
	2.5 Identify policies & plans					
	2.6 Identify monitoring, evaluation, reflection & learning strategies					
3. Protect ecology and biodiversity from Ridge to Reef	3.1 Implement commercial & domestic farming & agriculture management practice					
	3.2 Manage de-forestation & promote re-forestation					
	3.3 Promote alternative land uses					
	3.4 Coastal management practices					
	3.6 Community resource use agreements					
4. Deliver safe and secure water to consumers – Luganville; Fanofo; Palon; other	4.1 Relocate Luganville water supply					
	4.2 Fence Luganville source					
	4.3 Develop WSP for ALL water supplies					
	4.4 Demand management mechanisms					
	4.5 Sanitation & waste management					
	4.6 Establish water quality monitoring					
5. Mitigate Flooding	5.1 Preliminary flood mapping on topo					

Outputs	Activity	Year 1	Year 2	Year 3	Year 4	Year 5
	maps 5.2 Upgrade telemetric monitoring system 5.3 Flood Mitigation guidelines 5.4 Establish active flood warning system					
6. Manage watershed for sustainable hydropower	6.1 Manage and upgrade hydro scheme					
7. Develop & implement policy & regulations	7.1 Gazette & implement water protection zones 7.2 Establish & implement resource management legislation & Sarakata Watershed management plan 7.3 Compensation policy & delivery 7.4 Local resource use policy & plans 7.5 Effective communication strategies 7.6 Establish enforcement unit					
8. Community actively contribute to watershed management	8.1 River Care awareness					
	8.2 Water Safety Plans community awareness					
	8.3 Building sustainable futures community					

Outputs	Activity	Year 1				Year 2				Year 3				Year 4	Year 5
	education														
	8.4 Waste Management - national education & awareness	———	———	———	———										
	8.5 Community development training	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····
	8.6 Water Committee training	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····
	8.7 Plumber training	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····
9. Monitoring, evaluation, reflection and learning by all stakeholders	9.1 Monitoring & evaluation undertaken by stakeholders within the Project	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····
	9.2 Monitoring & evaluation of Project activities	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····	·····

Annex 4

Existing and Anticipated Project Profiles in Vanuatu for Co-Funding Obligations

Project Name:	Vanuatu Water Safety Plans (WSP) Program
Executing Agency:	DGMWR
Funding Source:	AUSAID
Project Value:	AUS$125,000
Project Timeframe:	2006 –2007
Location:	Luganville (urban) and Mele (rural) (Both watershed management)
Contact Person:	Rosette Kalmet, Erickson Sammy, DGMWR, Vanuatu Ph (678) 22423 email: ross.kalmet@gmail.com or amapelao@yahoo.com Davendra Nath, Water Safety Plans Officer, SOPAC Fiji
Project Purpose:	This is a risk assessment, risk management approach to providing safe quality drinking water. Basically to identify risks/critical points along water system and try to minimise/eliminate these risks for maintaining good quality water. The 4 pilots selected are Cooks, Vanuatu, Palau and Tonga.
Key Activities:	Prepare are implement WSPs for Luganville and Mele water supplies including risks and management options.
Benefits/Outcomes:	Improve quality of (reticulated and non-reticulated) water delivered in Vanuatu and increase the capacity of delivery agencies across all government sectors and communities to monitor water quality and contribute to safe drinking water.
Overlap or Compliment with GEF IWRM Project:	The intention of the WSP is twofold: It will contribute to protecting the water supply and providing safe and secure water to households as well as raining community awareness and contributions to sustainable development.

Project Name:	Water Quality Monitoring Capacity Building Program for PICs

Executing Agency:	DGMWR
Funding Source:	NZAID
Project Value:	NZ$100,000
Project Timeframe:	2006-2009
Location:	Vanuatu
Contact person:	Erickson Sammy (DGMWR) Vanuatu
Purpose:	Contributes to Pacific Regional Action Plan (2002) and Pacific Framework for Action on Drinking Water Quality and health (2005). Strengthen the capacity of in-country labs to accurately monitor the quality of their water (drinking and if needed coastal). The 4 pilots selected are Cooks, Niue, Vanuatu and Marshall Islands.
Benefits/Outcomes:	The Water Quality Monitoring program serves to verify that the Water Safety Program is functioning well and is indeed achieving safe drinking water. The Water Quality Monitoring program will develop capacity to analyse water quality accurately.
Contact Person:	Tasleem Hasan Program Adviser, Water Quality Monitoring Capacity Building, SOPAC, Fiji. Erickson Sammy, DGMWR, Vanuatu

Overlap or Compliment with GEF IWRM Project: Water quality moitoring is an essenatial part of any integrated watershed management.

Project Name:	HYCOS
Executing Agency:	DGMWR
Funding Source:	
Project Value:	
Project Timeframe:	
Location:	
Contact Person:	Chris Ioan Director DGMWR Vanuatu (678) Phone 22423

email chris_ioan1@yahoo.com.au or Erickson Sammy

Purpose:

Key Activities:

Benefits/Outcomes:

Overlap or Compliment with GEF IWRM Project

Project Name:	South Pacific RiverCare Project
Executing Agency:	Live and Learn Environmental Education
Funding Source:	NZAID
Project Value:	$315,305 NZD
Project Timeframe:	July, 2004 - November, 2007
Location:	Schools and Rural training Centres in Efate, Maewo, Santo and Malekula
Contact Person:	Robbie Henderson & Vatu Molisa (Live and Learn Vanuatu) Ph (678) 27448 email: livelearn@vanuatu.com.vu
Project Purpose:	Improve water quality in rivers in South Pacific island nations by building the capacity of young people to effectively participate in community-based river management and conservation.
Key Activities:	In Vanuatu the RiverCare project has focused on delivering teacher training and developing an innovative teaching and learning resource for schools and rural training centres. The project has included 4 phases: (i) Delivery of Teacher training on how to establish water quality monitoring and action projects in schools; (ii) Establishment of a RiverCare advisory group to determine learning outcomes and content of a teaching and learning resource; (iii) development of the teaching and learning resource; and (iv) training workshops for teachers on how to use the teaching and learning resource.

Benefits/Outcomes: One thousand copies of the 200 page RiverCare teaching and learning resource were published in June 2007. The resource contains 5 modules: (1) Discovering Water; (2) Water in Custom and Culture, (3) Ecosystems and Freshwater Habitats, (4) Living in a Catchment; and (5) Water, Waste and Pollution. The teacher training and delivery of resources to schools is set to commence on 4 Islands in 2007.

Overlap or Compliment with GEF IWRM Project:

The project will increase the capacity of Vanuatu teachers to deliver education about watershed management, land use, governance and decision making affecting water. The project will include teachers and students living in the Sarakata watershed.

Project Name: Waste Management Education Toolkit & Promoting Waste Minimisation in Vanuatu – Sustaining Change for Better Waste Management

Executing Agency: Live and Learn Environmental Education

Funding Source: SPREP & NZAID

Project Value: $4,000 USD + $55,000 NZD

Project Timeframe: July, 2007- July, 2008

Location: Nationwide (Vanuatu)

Contact Person: Robbie Henderson & Diana Hinge (Live and learn Vanuatu) Ph (678) 27448 email: livelearn@vanuatu.com.vu

Project Purpose: Provide waste management education resources in one educational package. Take action and advocate for waste minimisation in Vanuatu through household and community based programs which expand upon previous initiatives to reduce plastic pollution

Key Activities:

- Produce a waste education toolkit for SPREP.
- Establish small enterprises linked to waste minimisation and using rubbish as a resource
- Raise national public awareness on the changes required for waste minimisation, including a focus on plastic bag use

- Gain community support and readiness to adopt and sustain policy changes that contribute to waste minimisation
- Train shop assistants to promote plastic bag alternatives and minimise plastic bag use
- Raise awareness and capacity of community members to minimise waste disposal at a household level (using the 4 R's concept)
- Advocate and lobby National Government to adopt the waste minimisation policies and actions developed by the Green City steering committee in Vanuatu.

Benefits/Outcomes: This project aims to advocate for permanent legislation and policy changes that will sustain changes to waste management in Vanuatu. It further aims to establish new social behavioural norms by developing new attitudes and values toward waste minimisation. The approach includes development of small enterprises based on recycling and reusing of waste in order to achieve sustainable change.

Overlap or Compliment with GEF IWRM Project:

The project will reduce the impact of solid wastes on water resources in Vanuatu. Community members and students will understand the links between consumption, waste disposal, water pollution and its social, economic and environmental impacts

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Project Name: Building a Sustainable Future (Community Watershed Groups & Funds)

Executing Agency: Live and Learn Environmental Education

Funding Source: NZAID

Project Value: NZ$600,000

Project Timeframe: December, 2005 - December, 2008

Location: Vanuatu, Solomon Islands, Papua New Guinea & Fiji

Contact Person: Robbie Henderson & Amos Kalo (Live and Learn Vanuatu) Ph (678) 27448 email: livelearn@vanuatu.com.vu

Project Purpose: As a regional project, it aims to develop practical community programs using Education for Sustainable Development (ESD) methodologies to promote sustainable development in rural communities of Fiji, Papua New Guinea, Vanuatu, and the Solomon Islands.

Key Activities: Establishment of Catchment Committees (Vanuatu) as groups for learning and taking action toward sustainable development. This has a particular focus on integrated catchment management, forming partnerships and improved decision making for development within a catchment. In Vanuatu the first catchment group has been established in the Teouma River Catchment (Efate) and a future group will be established in the Sarakata catchment (Santo).

Benefits/Outcomes: Education for Sustainable Development 'is a process for learning how to make decisions that consider long-term future of the economy, ecology and equity of all communities. Building the capacity for such futures-oriented thinking is a key task of education'. In Vanuatu this will be developed through the vehicle of catchment groups, which aims to create more sustainable development and landuse within catchments.

Overlap or Compliment with GEF IWRM Project:

The catchment focus of this project in Vanuatu compliments Integrated water resource management objectives.

Project Name: Strengthening the Capacity of Chiefs, Land Owners and Local Councils to Safeguard Rainforest Resources in Vanuatu

Executing Agency: Live and Learn Environmental Education

Funding Source: The Canada Fund and International Women's Development

Project Value: $50,000 CND + $15,000 AUD

Project Timeframe: December 2006 – December 2007 (with likely extension to December 2009)

Location: Santo, Erromango, Tanna and Epi

Contact Person: Robbie Henderson & Amos Kalo (Live and Learn Vanuatu) Ph (678) 27448 email: livelearn@vanuatu.com.vu

Project Purpose: Heighten awareness and action among chiefs, tribal leaders, landowners and women towards sustainable use of forest biodiversity.

Key Activities: The project will be implementation through three key activities. 1: Delivery a comprehensive Environmental Education and Awareness Campaign for Chiefs and Landowner Groups on the sustainable use of forests and the links between forest and social issues and 2: Links established between local action and national policy by building capacity of local councils to advocate for sustainable development in the forest sector at provincial and national level. 3. Development of alternative sustainable income generating activities for communities using forest resources

Benefits/Outcomes: More informed and decisions regarding sustainable use of forest resources, improvements to land and water management and income earning opportunities for communities

Overlap or Compliment with GEF IWRM Project:

If successful the project may assist to protect water and catchments from degradation due to changes to hydrology, eutrophication and sedimentation that may result from poor forest management.

Project Name: Water Supply Committee Training

Executing Agency: DGMWR

Funding Source: NZAID / Various

Project Value: 6,000,000 Vatu

Project Timeframe: Ongoing

Location: Vanuatu National Program

Contact Person: Kalparam Gershom (DGMWR Vanuatu) Ph (678 22423

Project Purpose: Provide water supply management and maintenance training to community water committees to increase community awareness and sustainability of water supply systems.

Key Activities: The training of trainers to undertake training at community level. The training includes committee management, planning the development of a water supply, managing finances, maintaining the supply and communicating with stakeholders.

Benefits/Outcomes: 1. Sound sustainable management of water supplies by communities without future reliance on central government or donor support.

2. Empower Community

3. Improve managerial skills at the community level

Overlap or Compliment with GEF IWRM Project:

Lessons learnt from this project can be applied to communities within the Sarakata Watershed Management area to improve the communities' sustainable management skills

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Project Name: Water Supply Plumber's Training

Executing Agency: DGMWR

Funding Source: NZAID / Various

Project Value: 5,000,000

Project Timeframe: Ongoing

Location: Vanuatu National Program

Contact Person: Kalparam Gershom (DGMWR Vanuatu) Ph (678 22423

Project Purpose: Provide technical training to villagers on how to maintain and repair rural water supply systems, at the same time repairing one system to excellent working condition, and achieve maximum national coverage by holding three workshops per province.

Key Activities: 1. Training in plumbing skills (with the provision of practical manual)

2. Improve ability of communities to maintain and repair their water supply systems.

Benefits/Outcomes: Maintenance of rural water supplies is by far the most important action that will improve the sustainability of water supplies and contribute to increasing the number of people serviced by a good water supply system.

Secondary benefits will be an improved standard of living for village recipients including improved health and considerably reduced workloads for women. Time saved can now be spent on other domestic and/or economic and creative activities. The ability to monitor, maintain and repair their own water supply system will boost community morale and has positive spin offs for other community activities

Enabling communities to look after their own water supply is an economically efficient and socially desirable outcome.

Overlap or Compliment with GEF IWRM Project:

Where water is taken from a natural source the community is

taught how to protect the source to ensure a safe water supply.

The lessons learned from this project can also be applied to other projects to be implemented in the future.

Project Name: Port Vila Eco-Sanitation

Executing Agency:

Funding Source: NZHC for workshop, construction design manual, some materials

Project Value:

Project Timeframe: August 2004

Location: Tagabe River, Efate, & other VIBA locations Vanuatu

Contact Person: Wan Smol Bag, Vanuatu; Dr Leonie Crennan, Australia

Project Purpose: The Port Vila Eco-Sanitation workshop is a combined effort to address sanitation issues in the Tagabe River area, and introduce ecologically sustainable sanitation to the wider community through The Vanuatu Island Bungalows Association (VIBA). VIBA represents rural bungalow operators providing eco-tourists with lodging. The Tagabe River Management Committee (TRMC) represents a multi-stakeholder, inter-sector, multi-disciplinary, community-based initiative to restore and protect the watershed.

Key Activities:

1. Provide demonstration compost toilets in key locations within the Tagabe Watershed

2. Provide awareness and training to communities

Benefits/Outcomes:

1. Solve a major drawback to eco-tourism in VIBA through the elimination of tourist complaints about poor sanitation.

2. Ensure year round toilet availability even through severe drought.

3. Free water resources for more essential uses.

4. Lower installation and maintenance costs when compared with flush toilet systems.

5. Help make bungalow developments viable in areas with small water resources.

6. Eliminate local pollution of groundwater and coral reef systems.

7. Introduction of dry toilet technology

8. Improve health and hygiene through the major reduction of insect borne pathogens.

9. Demonstrate the viability of healthy toilet development in areas where groundwater pollution is a potential problem

10. Demonstrate that the composting toilet (CT) requires less land area than wet pit toilets thus increasing the area of arable land available to villages.

11. Contribute to protection of water quality in the Tagabe Watershed by assisting the Tagabe River Management Committee (TRMC).

Overlap or Compliment with GEF IWRM Project:

Lessons learnt from this project can be applied to sanitation and waste management of Sarakata watershed to improve water quality and quality of life and save lives.

Annex 5

Sarakata Watershed (Santo) Site Information Sheet (from Hot Spot Analysis)

1) Context of the site

   a. Human activities related to the site:

      i. Water Supply Sources – Luganville water supply, Pepsi hand dug wells as well as others - Fanafo, Stone Hill, Butmas, Ballon, and Monix Hill water supplies.

      ii. Industrial Activities – Timber, Iron roof, Nails, PWD, Workshops, Copra Mill, Soap Factories, Butcheries.

      iii. Sand Mining

      iv. Gardening/agriculture, logging, fish farming, fishing, livestock

      v. Recreational Activities

      vi. Residential Irrigation

      vii. Ship Dumping

   b. Natural conditions or natural disasters related to the site:

      i. Cyclones – flooding

      ii. Earthquakes – landslides

      iii. Drought

2) Nature and extent of threats

   a. Human:

      i. Toilet and Septic Systems

      ii. Cattle Grazing

      iii. Subdivisions

      iv. Logging - sedimentation and lower water level

      v. Agriculture – fertilizer

      vi. Industrial Waste – oil

      vii. Storm Water - runoff

   b. Natural:

      i. Flooding

      ii. Landslides

      iii. Sedimentation

      iv. Drought – water shortage

3) If there is pollution, list the sources:

   a. Industry
   b. Agriculture, Logging, and Livestock Waste
   c. Residential Areas – septic systems
   d. Sand Mining
   e. Road Construction – materials and vehicle fumes

4) Major Concerns and Issues:

   a. Freshwater Shortage (pollution of existing supplies)
   b. Pollution (Microbiological, Chemical, Suspended Solids, Mining Wastes, Solid Wastes, Oil Spills)
   c. Habitat and Community Modification (loss of ecosystems or ecotones – removal of mangroves, modification of ecosystems or ecotones)
   d. Unsustainable exploitation… (over-exploitation, impact on biological and genetic diversity)
   e. Global Change (Changes in hydrological cycle including droughts and cyclonic flooding and damage, i.e. climate variability, sea level change, changes in ocean CO2 source/sink function – cattle and coconut)
   f. Other (n/a)

Annex 6 - Logframe

Component	Activity	Output	Performance Indicators
1. Project Management Unit Established	1.1 Project manager and staff contracted	Project Manager and staff appointed and implementing the project.	**PMU established by 1st quarter , Year 1**. Project Manager appointed by 1st quarter, Year 1
	1.2 Project offices established	Project Office etablished virtually on site to ensure coordination of all components	Office space made available by DGMWR in Luganville office by 1st quarter, Year 1
	1.3 Membership and TOR of Steering Committee established	Review of water committee membership & TOR completed and in effect.	Composition of steering committee and TOR completed by Year 1
	1.4 Project management and monitoring systems established	Project management and monitoring procedures deeveloped	Monitoring system done by mid-Year 1
	1.5 Project Steering Committee meetings	Existing Sanma Water Advisory Committee strenghtened and actively involved in executing the Project	4 meetings per year, meeting minutes distributed to stakeholders
2. Sarakata Watershed Management	2.1 Participatory ecological and socio-economic surveys	Biodiversity & behavior & beliefs surveys completed in order to understand the existing situation.	**1 Watershed Management Plan developped and operative by Year 5** Survey completed by Year 1

Component	Activity	Output	Performance Indicators
Plan	2.2 Technical surveys undertaken and data collated	Data for water resource management collected and collated for planning	Technical survey completed by Year 1
	2.3 Prepare watershed land use maps using VANRIS	Watershed land use developed, water resource data and information from the ecological, socio-economic & technical surveys included in the VANRIS system.	Declaration of Sarakata watershed as physical planning zone for Sanma province by Year 5, 1 land use map developed by Year 2.
	2.4 Identify core values and uses	Core values and uses identified for developing management strategies, policies and plans.	Core values and uses identification completed by Year 2
	2.4 Identify management strategies	Management strategies for dealing with land use issues identified.	Management strategies developed by Year 2
	2.5 Identify policies & plans	Policies & plans developed	# policies and plans developed
	2.6 Identify monitoring, evaluation, reflection & learning strategies	Lessons learnt shared with other national & regional agencies working in sustainable watershed management.	Monitoring and evaluation system put in placed by Year 1
3. Ecology and biodiversity from Ridge to Reef support and sustain wise resource use	3.1 Implement commercial & domestic farming & agriculture management practices	The development of good subsistence and commercial farming practices within the watershed.	1 farming practices manual developed and operational by Year 4
	3.2 Manage de-forestation and promote re-forestation	Development of deforestation and reforestation management by	No. of trees replanted per year , control of logging licences

Component	Activity	Output	Performance Indicators
		improving ecology & water quality.	
	3.3 Promote alternative land uses	Alternative land use practices developed and promoted.	Land Use planning map completed by Year 3
	3.4 Coastal management practices	Best sustainable coastal management practices developed and implemented.	Manual developed, # of awareness raised and community involved
	3.5 Sanitation & waste management	Development of good sanitation & waste management practices have regional application.	Improved water quality, ? % reduction of waterborne diseases
	3.6 Community resource use agreements	Community resource use agreements in place.	# communities signing to the agreement / enforcing
	3.7 Establish protected areas	All protected areas support biodiversity and provide regional benefits	# hectares protected areas in watershed / year
4. Deliver safe and secure water to consumers - Luganville; Fanafo; Palon; Russell Donovan; Other	4.1 Relocate Luganville water supply intake	New bores, pumps, storage tanks and pipes established to connect to current water system.	**Water source protection zone established by Year 5** Water source relocated by Year 1 Safe & secure water supply
	4.2 Fence Luganville source	Protecting local water security by excluding unwanted activity from protected zones 1&2.	Fencing of the (55 hectare) WPZ completed by Year 3
	4.3 Develop Water Safety Plans for all water	Water Safety Plans for water supplies within the watershed	1 Water safety developed for

Component	Activity	Output	Performance Indicators
	supplies	developed and enforced	Luganville by Year 1 3 community water safety plans developed by Year 5
	4.4 Demand management programs and mechanisms	Capacity building on water demand management for water supply personnels	1 training every 2 years executed for Luganville PWD
	4.5 Establish ground & surface water quality monitoring programs	Water quality monitoring program established and operational	A monitoring program established, the # waterborne diseases reduced by 5%
5. Mitigate Flooding	5.1 Preliminary flood mapping on top maps	Flap mapping completed & operational	**1 Flood mapping completed and a warning system established and in operational by Year 5**
	5.2 Upgrade telemetric monitoring system	Improved local flood management data	A flood monitoring system established by Year 2
	5.3 Develop & implement guidelines for flood mitigation	Guidelines developed including best land practices, prevention, awareness etc.	Flood mapping zone developed, # awareness raised in communities
	5.4 Establish active flood warning system including awareness and education	Methods for flood warning can be shared regionally. Reducing impact of flooding has regional economic benefits.	A flood warning system developed, # awareness raised
6. Provide for sustainable hydro power	6.1 Manage and upgrade existing hydro scheme	Utlizing the watershed as a source for developing sustainable hydro power to provide Energy for local	**3rd phase Hydro-power completed and operational by Year 3**

Component	Activity	Output	Performance Indicators
		residents.	
7. Develop & implement policy & regulations	7.1 Gazette & implement water protection zones	National policy – Establishments of water protection zones.	**Luganville Water Protection Zone established and gazetted by Year 5**
	7.2 Establish & implement policies & procedures to exact WRM Act & Sarakata Watershed management plan	Development of appropriate policies and procedures w.r.t Watershed Management Plan	# policies developed
	7.3 Compensation policy & delivery	Land acquization for water intake and protection zones	Water protected zone (areas) compulsory acquired by Year 5
	7.4 Local resource use policy & plans	Local resource use policy and plans developed	1 policy and 1 plan developed by Year 5
	7.5 Develop an effective enforcement unit	Restructure DGMWR to ensure enforcement of policies and regulations	Enforcement unit established within the new new DGMWR structure by Year 1
8. Community actively contribute to watershed management	8.1 Deliver community awareness and education programs	River care awareness program implemented	**Attitude changes (dependency to self-reliance)** # community engagement in the program, # awareness program raised
		WSP awareness program implemented	# awareness programs executed / year

Component	Activity	Output	Performance Indicators
		Community in Sarakata mobilized (sustainable development initiatives)	# local initiatives and people mobilised
		Waste Management education & awareness program delivered	# awareness programs executed / year
	8.2 Deliver Community capacity building training	Community training given during installation of every water supply within the watershed.	2 community development trainings conducted
		Water committee training delivered to all water supply committees	4 water committee trainings conducted
		Plumber training delivered Government in all water supply committees	4 plumbers trainings conducted
9. Monitoring, evaluation, reflection and learning by all stakeholders	9.1 Monitoring & evaluation of Project activities	Monitoring and evaluation of project undertaken.	2 monitorings per year