SOPAC/GEF/IWRM/RSC.2/9
Date: 18th June 2010
Original: English

Second Meeting of the Regional Project Steering Committee
and Inception Workshop for the SOPAC/UNDP/UNEP/GEF Project:
"Implementing Sustainable Water Resource and Wastewater Management in Pacific Island Countries"

Republic of Palau, 19th – 23rd July 2010

PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM PROJECT STATUS

SOPAC Pacific HYCOS Progress Report No 6

Prepared by

Pacific HYCOS Project
SOPAC, Fiji

February 2010

Pacific Hydrological Cycle Observing System

6th Progress Report

Period Covering June to December 2009

Contents

LIST OF ACRONYMS..... 5

EXECUTIVE SUMMARY..... 6

1. INTRODUCTION..... 8
   - 1.1 WHYCOS MISSION STATEMENT..... 8
   - 1.2 PROJECT BRIEF..... 9

2 GENERAL ACTIVITIES..... 11
   - 2.1 PROJECT REGIONAL CENTRE ACTIVITIES..... 11
   - 2.2 PROGRESS ON SPECIFIC PROJECT COMPONENTS..... 11
   - 2.3 COUNTRY ACTIVITIES..... 18
   - 2.4 DEVELOPING ENSO EVENT..... 23
   - 2.5 ONGOING ISSUES..... 24

3 RISKS AND MITIGATION..... 25
   - 3.1 MITIGATION MEASURES..... 26
   - 3.2 CHANGES INTRODUCED IN IMPLEMENTATION..... 27

4 WORKPLAN FOR PERIOD JANUARY TO JUNE 2010..... 28
   - 4.1 PACIFIC HYCOS WORK PLAN 2010 FIRST 6 MONTHS..... 28
   - 4.2 COMMUNICATIONS STRATEGY..... 31
   - 4.3 LIFE BEYOND HYCOS..... 31
   - 4.4 NATIONAL VS REGIONAL SUPPORT..... 32

5. FINANCIAL SUMMARY FOR ACTIVITIES UNDERTAKEN..... 33

LIST OF ANNEXES..... 35

ANNEX 1 EU ROM REVIEW

ANNEX 2 PROJECT LOG FRAME

ANNEX 3 STATEMENT OF PROJECT AND RELATED EXPENDITURE

3A

3B

3C

3D

3E

List of Acronyms

4WD	Four-wheel-drive vehicle
ADB	Asian Development Bank
AHA	Australian Hydrographers Association
AusAID	Australian Agency for International Development
CBA	Cost Benefit Analysis
DCP	Data Collection Platform
DEC	Department of Environment and Conservation (PNG)
DOH	Department of Health
DRM	Disaster Risk Management
DTCI	Department of Transport, Communications and Infrastructure (FSM)
DWW	Department of Water Works (Cook Islands)
EDF	European Development Fund
EPA	Environment Protection Authority
EQPB	Environmental Quality and Protection Board (Palau)
EU	European Union
EU-WF	EU- Water Facility
FFWS	(Fiji Rewa River) Flood Forecasting and Warning System
FP	Focal Point
FSM	Federated States of Micronesia
GEF	Global Environment Facility
GIS	Geographic Information Systems
GoK	Government of Kiribati
GoT	Government of Tonga
GoT	Government of Tuvalu
GPS	Global Positioning System
HYCOS	Hydrological Cycle Observing System
ICT	Information Communication and Technology
ICU	Island Climate Update Project
IWRM	Integrated Water Resources Management
MNRE	Ministry of Natural Resources and Environment (Samoa)
MoH	Ministry of Health
MRD	Mineral Resources Department (Fiji)
NHN	National Hydrological Network
NHS	National Hydrological Service
NIWA	National Institute for Water and Atmospheric Research (New Zealand)
NMS	National Meteorological Service
NZAID	New Zealand Agency for International Development
PACTAM	Pacific Technical Assistance Mechanism
PIC	Pacific Islands Countries
PI-GCOS	Pacific Islands Global Climate Observing System
PI-GOOS	Pacific Islands Global Ocean Observing System
PMU	Project Management Unit
PNG	Papua New Guinea
PRC	Project Regional Centre
PSC	Project Steering Committee
PWD	Public Works Department
RAP	(Pacific) Regional Action Plan (on Sustainable Water Management)
RMI	Republic of Marshall Islands
RMI EPA	Republic of Marshall Islands Environment Protection Authority
RWH	Rainwater Harvesting
SEAWAT	A Computer Program for Simulation of Three-Dimensional Variable-Density Groundwater Flow and Transport (Software)
SOPAC	Pacific Islands Applied Geoscience Commission
TIDEDA	Time Dependent Data (Software)
UN-DDSMS	United Nations Department for Development Support & Management Services
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USGS	US Geological Survey
WaSSP	Water Sector Support Programme (Samoa)
WEU	Water Engineering Unit (Kiribati)
WHYCOS	World Hydrological Cycle Observing System
WMO	World Meteorological Organisation
WQM	Water Quality Monitoring
WRMB	Water Resources Management Branch (PNG)
WSP	Water Safety Planning

Executive Summary

Funded through the European Union's Water Facility, the Pacific HYCOS programme is implemented by SOPAC jointly with the World Meteorological Organization (WMO), UNESCO and the Fiji Meteorological Office as Associate Partners. Pacific HYCOS is assisting the Pacific island countries with the installation of hydrological monitoring stations, collection, storage and analysis of information necessary for water resource assessment, management and infrastructure design. Individual country scoping was undertaken early in the project, implementation plans drawn up finalised and implemented, based on a common theme of seriously reduced capacity and related infrastructure at the national level for hydro-meteorological data collection and storage. The project was scheduled for completion in July 2009. Due to a longer timeframe required for the planning and implementation stage, the EU agreed in June 2009 for an 18 month no cost extension to the end of 2010. An EU ROM review was also undertaken later in 2008 to review implementation aspects of the project and to assess areas where project delivery could be improved.

The period reported on for this Pacific HYCOS Project Progress Report No 6 covers 1st July to 31st December 2009. This period has continued with completion of the "Project Implementation" phase, or the installation and rehabilitation of hydrological stations which has been overly prolonged in most countries. The consolidation phase was commenced in certain countries where reliable data is being collected and archived appropriately. Activities are concentrating on implementation activities and support across the three island water source types: surface water; ground water; and rainwater dependent countries. During the final 12 months of the project, activities will concentrate on support to the countries of Palau, Samoa, Nauru and Tonga who are best demonstrating their capacity to implement and offer a degree of sustainability.

The Project Regional Centre based at SOPAC is still at full strength but as funding becomes compromised, 2010 will bring staff reductions within the PRC.

The predominantly surface water countries of the Cook Islands, Fiji, FSM, Palau, Samoa, Solomon's, PNG and Vanuatu have continued with project implementation under HYCOS assistance at varying levels. This has progressed steadily with installation of raingauges and streamflow measuring stations to allow water resource assessments of major rivers to be almost complete. The time taken to undertake this due to reduced capacity and NHS constraints has been overly extended and some of the countries have yet to fully implement field installations and to undertake field activities on a regular and robust basis to enable the measurement of stream flows, drought sequences and floods.

Rescue of historical hydrological data into a well structured and supported regional database is a significant and emerging legacy of the project. However a cursory review of these historic datasets indicates that the data is of generally poor quality and is of limited use in its current form, with a large

number of gaps, very poor rating curves, inconsistency and in some cases low confidence in the raw data records. Only a detailed review could assess and edit this data, if at all possible, for useful datasets. In the case of PNG and Fiji, this could amount to person years of input, elsewhere many person months at a minimum. The PIC's do not have this level of capacity for detailed data review, assessment and analysis at this stage. SOPAC experts and consultants have provided the capacity development and training inputs to date directly into countries for data management.

Support for groundwater dependent countries has focused on consolidation of monitoring procedures and developing consistent and reliable data sets. HYCOS has provided support to water resource management using professionals based in Tuvalu and Niue who have worked with the agencies and their staff on a day to day basis. Whilst this approach has found to be reasonably effective in providing capacity building, the sustainability issues are again of considerable concern. Water quality monitoring continues to be an important component of this with a real need for simple, reliable and robust sampling and analysis programs.

There has been no formal project steering committee meeting in this period, however liaisons through the Pacific IWRM Project Steering Committee meetings and engagement whilst on HYCOS missions has allowed for effective engagement with many of the country focal points and their management. A piggy back arrangement is proposed for late July 2010 in Palau where many of the HYCOS focal points will be present for the IWRM GEF PSC meeting to discuss life beyond HYCOS and a pathway forward. This requires further and ongoing political commitment from PIC's to support National Hydrological Services which in large, are still poorly recognised, supported and resourced.

A coordinating mechanism has been developed with WHYCOS and other Pacific observing systems such as the Pacific Global Climate Observing System,(PI-GCOS), and the Pacific Global Ocean Observing System (PI-GOOS), which are based at SPREP and SOPAC respectively. In terms of awareness and advocacy, a joint e-newsletter has been supported under the banner "Vai Pasifika", a Pacific HYCOS website (www.pacific-hycos.org) has been established which now has close to 29,500 hits. Linkages have been established with national disaster management committees and high level meetings have been organised with permanent secretaries, and media coverage arranged to highlight the ongoing and growing need for water resource monitoring, assessment and management issues in various countries.

This extended contract period will be used to complete implementation and to concentrate on project consolidation. However it recognised that continued technical and financial support is required beyond the life of the project to further develop skills and embed procedures to allow a state of sustainability for field operations and data collection activities to be achieved in time.

Options for consideration of additional technical and financial support have been raised and the type of assistance options that need to be considered to support project initiatives into 2011 and beyond until the NHS's are in a stronger position to be self supporting of the project initiatives. The will be further expanded on in the final report to be submitted prior to project closure.

1. Introduction

1.1 WHYCOS Mission Statement

"To strengthen the technical and institutional capacities of the National Hydrological Services to collect and transmit, in real or near real time, hydro meteorological data and information of a consistent quality, thereby improving water resource assessment and management and promoting regional and international cooperation in data collection, sharing and research"

The Pacific HYCOS project is a regional component of a global World Meteorological Organisation Programme, WHYCOS. The project is managed by the Pacific Islands Applied Geoscience Commission (SOPAC) in partnership with the World Meteorological Organisation, Fiji Meteorological Service and the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

The European Union has contributed €2.52million Euro towards Pacific HYCOS. The three year project which commenced operationally in December 2006 focuses on supporting rainwater, surface water and groundwater monitoring networks to provide valuable resource based data thereby improving development and sustainability of natural water resources. Pacific HYCOS is being implemented in 14 member countries including Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

The overall objective of the Project is to attain a sustainable level of ability and capacity in participating Pacific island countries to monitor and assess the status and trend of their water resources, and to provide the water-related design data, information and hazard warnings needed to support national social and economic development and environmental protection.

Following the agreement of the European Union to an 18 month no cost extension granted in June 2009, the project will now be completed in December 2010.

Specifically the project will assist the participating countries to establish the human and institutional capacity to measure and assess the status and trend of national water resources and to provide adequate warnings of water-related hazards through the establishment of basic hydrological monitoring and data capture systems and Water Resources databases and information systems that provide national, sectoral and catchment users with the information they require. The specific project components are;

- Flood forecasting capability.
- Water resources assessment in major rivers
- Water resources databases
- Drought forecasting
- Groundwater monitoring and assessment
- Water quality monitoring and assessment
- Project management

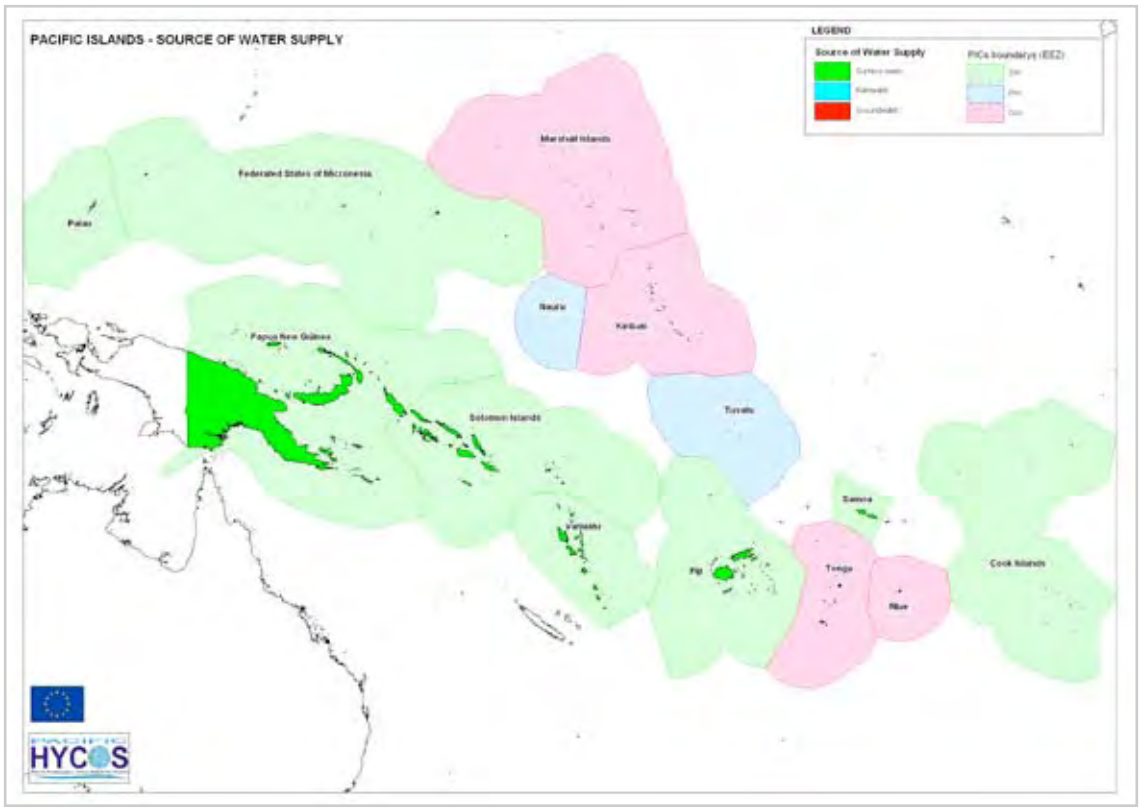


Figure 1.1: Pacific Islands Countries showing predominant water sources

1.2 Project Brief

The Pacific HYCOS Project has been implemented in three phases, a Preparatory Phase, a Project Implementation Phase and a Project Consolidation Phase.

Activities identified in each phase can be traced back to the Pacific Regional Action Plan (PRAP) SOPAC 2002, which provides a blueprint for sustainable water management activities in the Pacific Island Countries.

This end of year report (Progress Report No 6) for 2009 focuses on the Project Implementation which covers three stages (i.e. planning, implementation and consolidation) and introduces a new phase to undertake activities for sustainability of the project which will be addressed during 2010.

Figure 1.2: Timelines of Pacific HYCOS Project delivery

Institutional and operational capacity in Hydrology varies considerably within the PIC's and this has resulted in each country developing their capacity at different stages.

The three main phases of the Pacific HYCOS Project include;

1. **Project Preparatory Phase** – implementation of activities and programmes to support Pacific HYCOS objectives, including regional training in surface and groundwater monitoring, water quality monitoring and capacity building activities.

2. **Project Implementation Phase**

2.1 Planning Stage

Scoping, preparation and submission of the Project Implementation and Work Plan which is country specific and was finalised in December 2007.

2.2 Implementation Stage

This covers implementation of the work plan including equipment purchasing, installation, development of monitoring schedules/programmes and ongoing training and capacity development.

2.3 Project Consolidation Stage

This stage commenced in 2009 and will continue into 2010 with a focus on consolidation of skills and technologies installed, operation and maintenance of instrumentation and hydrological archiving and analysis.

The need for an additional phase has been identified from the project implementation and consolidation activities undertaken to date,

3. **Project Sustainability Phase**

It has become increasingly apparent during the implementation phase, that skills and expertise, access to recurrent funding, and high level support and awareness for the collection and analysis of hydrological data is still seriously lacking for NHS's in most PIC's. Many NHS's still have a weak resource and capacity base, being placed within agencies such as a Public Works Department, Environmental Agency or Water Supply Utility where hydrology has poor visibility and monitoring is seen as extra work without added manpower and financial resources being made available by National Governments. NHS's are in general capable of absorbing the project activities, but require support and commitment from governments to assist their NHS's and their staff to achieve the desired outputs and outcomes. In particular access to consumables, dedicated and appropriate 4WD vehicles, river boats and fuel is still significantly hampering the project implementation, consolidation and sustainability of data collection activities over the long term. Generally this situation has not improved in the 3 year period since the project commenced implementation.

2. General Activities

Activities to date have been largely based on the project logical framework and implementation plan and progress has generally been measured against this. In many cases it has not been possible to achieve certain deliverables, where circumstances such as not being able to achieve collection of even basic datasets, preclude meeting the desired outcome. More recently there has been need to diversify activities to increase project visibility and products and additional activities have been added to assist HYCOS implementation, strengthen objectives, to address consolidation and sustainability.

2.1 Project Regional Centre Activities

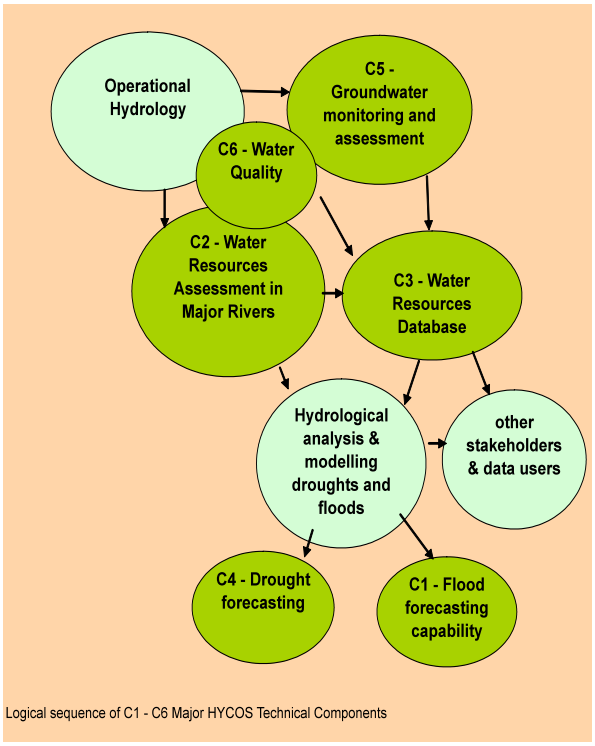
The PRC is still fully established with all professional and support staff consolidated in their specific roles. The implementation mobilisations have identified where staff are best utilised and this is reflected through the work plan, regular staff meetings and task assignments, both at a PRC level and through international missions.

2.2 Progress on specific project components

The Pacific HYCOS Project has 6 specific technical components, these are discussed below but it needs to be appreciated perhaps that the core task to achieve these is the operation of a robust operational hydrological field program based on sound operational planning, instrumentation, equipment and field installations supported by well resourced and trained staff. Quite clearly, if Task 2.2.2 Water Resource Assessment in major rivers cannot be achieved, delivery of the other technical tasks will remain seriously compromised.

Figure 2.1 (overleaf) shows the identified project components No's 1 – 6 and their respective dependence on components in the top left of the flow chart. Additional components in light green indicate essential stages of the design document but not specified in it. For example, without a robust and well resourced NHS and operational hydrology program, water resources assessment in major rivers or aquifers is unlikely to occur. If discharge measurements are not undertaken in small to medium floods, one cannot expect to understand or model larger or extreme floods. This is largely where Pacific HYCOS is still at, in that the NHS's generally remain seriously under resourced, many still do not have transport, water resources are only assessed in part, and floods are not being measured. This is despite HYCOS initiatives which have extended into all aspects of operational hydrology with instrumentation and equipment, technologies, software and training, mostly conducted in-country. HYCOS is focussing on providing technical support to develop confidence, understanding and skills of hydrology staff, with the long-term objective being country ownership and support to its water resource monitoring and assessment needs. Some significant gains have been made through HYCOS with regard to operational sites and developing skill sets in countries including data rescue, data archiving, and rehabilitated and new monitoring sites and stations, however it will require continued support to develop the full ownership, sustainability and higher level capacity. Indeed given the isolation and small skill sets in

the Pacific, there is likely to be an ongoing need for technical assistance and support where increased water resource demands are requiring more technical, engineering and science based solutions. At a minimum, a robust, consistent and accessible data set on water resources will be required to support these decisions, the IWRM process, and to test solutions. As the understanding of water resource management needs are developed though the IWRM EU and GEF programs, it is expected that ownership of HYCOS initiatives will further increase with subsequent increase in support for the NHS's and suitable institutional placement and support.



- Component 1 - Flood forecasting capability.
- Component 2 - Water resource assessment in major rivers.
- Component 3 - Water resources databases
- Component 4 - Drought forecasting
- Component 5 - Groundwater monitoring and assessment.
- Component 6 - Water quality monitoring and assessment.

Figure 2.1: Pacific HYCOS Technical Project Components

2.2.1 Flood Forecasting Capability

Only Fiji has any form of flood forecasting and warning system (FFWS) in place. HYCOS has funded the Rewa River FFWS and is providing ongoing support to the EDF 8 funded Navua FFWS. To date, ongoing institutional, resourcing, capacity and communication issues within the Fiji NHS have precluded any effective monitoring or warnings to be generated to date. It is now improbable that any of the surface water NHS's will be in a position to embrace this level of technology or commitment at this stage. For many NHS's, it is taking some effort to maintain a basic two or three station pilot system for water resource assessment. A review of PIC data archives shows little to no measured flood data or ratings (of any quality) that can be used for developing flooding models thereby leading into flood forecasting. Recurrent resources severely limit the NHS mobilisations to the field to measure this essential information, even for small floods. Unless small to medium floods are measured, we can have little understanding of larger floods as much of flood estimation used in FFWS's is based on underlying sparse and poor quality river flow data and rainfall. Remote sensing or post flood estimation using channel survey is not a substitute for actual flood measurements. Current indications are that few substantial flood measurements will be undertaken during the remaining life of the project due to these ongoing issues unless the respective NHS's resource this accordingly. Replication of FFWS's or telemetry of data in other surface water PIC's is not being considered now due to the prevailing institutional and capacity issues. This is also compounded with poor communication options from

remote locations. HYCOS continues to work with Fiji with technical assistance being provided for the development of FFWS proposed in the Nadi and Ba catchments, little traction has been possible. Generally, lessons learnt indicate that until the well resourced NHS model (WMO Publication– No 1003) is adopted and sound field operation standards and data collection principles are in place, including technical exerts being engaged, commissioning and operation of FFWS's for effective flood monitoring and warning will remain compromised.

2.2.2 Water Resources Assessment in Major Rivers

This component needs to be considered as the most significant of the 6 technical components of the Pacific HYCOS Project. Without sustainable water resources monitoring and assessment in major rivers, it is not possible to advance towards any of the other tasks such as flood and drought monitoring. Most of the surface water countries are making only modest progress, with some more than others within their pilot river basins. Implementation has allowed for the installation of water level and rainfall stations in all countries but this is only the first step in allowing river discharges to be measured which also requires development of site specific river discharge ratings. All NHS's now have the necessary tools and basic training to undertake these tasks, however limited government support to the NHS's reduces their effectiveness and capacity to mobilise to the field. Impediments still relate to infrequent access to vehicles, boats, fuel and necessary consumables, allowances etc which would allow for regular field mobilisations and the operation of field stations. Water resource data rescued to the TIDEDA database and subsequent review indicated it is generally of quite poor quality due to frequent large gaps and questionable data and ratings. This data is of limited use without a major reassessment and probably reprocessing of chart data. If water resources monitoring and assessment of these pilot basins remains difficult to achieve and sustain, it severely compromises delivery of Components 1, 3 and 4. For delivery of this component, full time technical expertise is now seen as being essential in each country, to provide sustained training and mentoring of staff in the diverse tasks associated with operational hydrology. All NHS's now have instrumentation and field equipment, computers and software to capably undertake this component which equips them as well as any field team in Australia or New Zealand.

2.2.3 Water Resources Databases

The TIDEDA database system was adopted at an early stage of the project as the regional hydrological database. This database package has been used in many of the surface water countries since the mid 1980's and is robust, highly appropriate, stable and well supported. Rescuing of available electronic data to this database has been largely achieved with much of the available regional data archived, especially for surface water. Rescue of paper based data is also advanced in some countries through manual entry and digitising. Backups are held at the PRC in Suva. A review of this data, much of it long term for the Melanesian countries, shows that much of it is of poor quality and an extensive review of this and the original data would be needed to assess its worth or otherwise. Significant challenges exist which limit the accessibility and usability of the data due to a multitude of data files, inconsistent database structure and concerns around questionable data. In the extreme case, to fully assess the multiple datasets for most recent and appropriate data would amount to many person months. To assess it for quality and to undertake edits or reprocessing to assemble useful data would amount to person years of input. Whilst this component has relatively easily rescued computer based data to the regional archive, identification of good data for editing and analysis remains an ongoing task and is not achievable within the life of the current project.

Whilst the NHS database staff use TIDEDA, it is largely with a low level of confidence. This will improve as familiarity and need develop, however as many staff are not from a hydrological background and without detailed intensive in country training, this will be difficult to achieve. Meanwhile HYCOS has developed a procedure whereby the data returns to PMU for basic quality assurance and archiving, providing security and accessibility.. Despite regular requests for data from HYCOS sites, data transfer

to the PRC is proving difficult to achieve. In general the concepts of good database management are generally understood but are not put into practise. In some cases it is one of lack of confidence and in others lack of direction. ICT support is generally poor, numerous viruses present themselves, data is sometimes lost and the need for a committed database manager and regular backups has not gained much traction.

Independent of the Water Resources Database, an Hydrological Assets Management database has been developed for management and tracking of HYCOS purchased equipment, mobilisations etc and this has been fully populated.

2.2.4 Drought forecasting

Monitoring of surface water and groundwater has been inconsistent in the past and not all the required information is readily available. There is a noticeable decline in the quantity and quality of data for surface water since the early 1990's when countries lost the support and funding from external agencies to collect data. Monitoring was not considered a high priority. However more recently with stress on water resources from increased population, urbanisation and climate extremes there has been demand for greater understanding and management necessitating greater reliance on reliable water resource data, unfortunately this is not available.

Drought forecasting or predicting and managing the impacts to the resource requires measuring and monitoring the resource during these climatic extreme periods to allow for more accurate predictions during future events. For surface water, lack of low flow water levels, discharge measurements and rating curves preclude any drought analysis to be undertaken on any of the available datasets in any country. Rainfall data is equally discontinuous apart from at NMS sites. Monitoring of water quality and quantity, as well as abstraction rates is essential to assess impacts to groundwater resources and their reliance during these extended dry periods. Streamflow and rainfall stations, surface and groundwater equipment to undertake such measurements are now available and generally installed for all for the PICS. Training has been given in the use of all of capital equipment and it is expected that a good standard of measurements will be collected in the ENSO El Niño event which is currently affecting the region. As forecasting droughts is in principle the role of the NMS's the NHSs are being supported with increased drought monitoring capacity where possible. It remains doubtful that any of the NHS's will be able to undertake actual drought forecasting. Drought monitoring however can be currently undertaken by all NHS's.

HYCOS has focussed on engaging and promoting the existing climate information projects including Island Climate Update, ICU, and the Pacific Islands Climate Prediction Project PICPP, as well as accessing the other climate information services both within the Pacific and produced for the Pacific. HYCOS is interested in promoting these existing services where the climate information can be accessed by water resource managers rather than attempt drought forecasting. The focus is on knowing how to access and utilise the available information when undertaking water resource management and assessment. There is a need for NHS staff across the Pacific to develop the basic analysis of the rainfall data to assist with drought forecasting, this particularly relevant in the atoll countries which are heavily reliant on rainwater harvesting and groundwater where available.

2.2.5 Groundwater monitoring and assessment

Efforts into maintaining regular and reliable monitoring of key groundwater monitoring bores and reporting on resources as well as progressing remaining implementation has provided the focus for the activities over the last half of 2009. In general all equipment for groundwater monitoring has been deployed by the end of the 2009 period. Some implementation activities remain and expect to be largely completed during the first half of 2010. These include a coordinated water quality and shallow well investigation in Nauru, and further data management and capacity development in Tonga.

In addition Fiji Mineral Resource Department requested assistance with the investigation of groundwater resources of Sigatoka utilising resistivity equipment procured under HYCOS. The results are being used to direct drilling of test holes to determine additional groundwater potential and location of monitoring boreholes

Whilst Kiribati, Niue, Tonga, and RMI rely upon groundwater for most of their potable water needs the use of monitoring data to improve efficiency of abstraction, and maintain water quality is poor. There is a perceived lack of drive to utilise and report on resources resulting in poor data collection and management, jeopardising future management and sustainability of the resource. The reasons for this are many and include lack of ongoing funding, poor leadership, migrating staff, limited available skills, and a perception by PICs suppliers and managers that the resource will continue to be able to provide safe and sufficient water needs a "she'll be right" attitude. This approach coupled with a general apathy, lack of ability, understanding by NHS staff is limiting the opportunities for utilising these resources into the future.

It is important that longer term support for PIC's is considered. A structured approach to groundwater management particularly in the data management and data analysis areas is required by NHSs. The more successful aspects of capacity building undertaken in the groundwater component have been the deployment of professionals to work alongside country counterparts in groundwater reliant countries. HYCOS has been directly responsible for placement of professional staff in all groundwater and rainwater harvesting only countries including Niue Tuvalu, Kiribati, and RMI for periods ranging from 3 months to 2 years. Tonga and Nauru with the assistance of HYCOS will also benefit from medium to long term in country professional support in 2010.

2.2.6 Water quality monitoring and assessment

Water quality measurements must be considered along with the component on water resources assessment in major rivers (See 2.2.2) as part of a National operational hydrology program, especially for suspended sediment. All surface water countries have this equipment to undertake basic sediment measurements. As groundwater in Pacific atoll countries is reliant on basic water quality for its assessment and management, water quality equipment and training has been a fundamental component of the HYCOS support. In countries where reliance on potable water from rainwater and groundwater is important additional support for microbial pathogen measurement has been provided.

Partnering with Drinking Water Safety Planning and Water Quality projects further bolsters the expertise and understanding for protection of and monitoring of potable water sources. However the same limitations recognised for 2.2.2 (transportation, resources, laboratories and perceived need) currently preclude, particularly in the surface water countries, from undertaking the reliable and essential baseline measurements and analysis.

In November 2009 the Department of Health (DoH) in Nauru were under Pacific HYCOS able to extend their analysis capabilities to include bacteriological assay of water samples. The IDEXX Colisure system was introduced, with laboratory staff and training provided during this time. In conjunction with water supply and DoH staff a monthly monitoring programme on the distribution of utilities delivered water was setup. This information will be used to identify which parts of the supply chain are at highest risk and what if any seasonal impacts to water quality may occur.

2.2.7 Project management

The Project Management component is progressing in line with project document requirements. In large, the requirements of the Donor and implementation agency are met and are seen as sufficient to meet the technical and financial reporting requirements.

There has been a need to compromise with some of the projected outputs against what is achievable and realistic. This is due in part to the lack of PIC resources and commitment for certain components; support to lesser performing countries is to be scaled down this year.

Following the independent project technical review undertaken in April 2009, the EU conducted an independent Results Oriented Monitoring (ROM) review in September of the project which allowed for a visit to Tonga, Kiribati, Fiji, FSM, Palau, RMI and Tuvalu. The ROM assessed the project for the relevance and quality of design, efficiency of implementation to date, effectiveness to date, impact prospects and potential sustainability The outcomes of this ROM are attached in Annex 1.

Full participation of stakeholders has been encouraged throughout and only in part is assisting in implementation and mitigation measures. It has been extremely difficult to get water committees and the like to meet and discuss HYCOS issues and how to best advance the project. Lack of supporting legislation and policy has also impeded progress and it is expected that EU and GEF IWRM will advance this as possible.

Figure 2.2 presents the relative progress with respect to the specific project technical components. These have progressed only modestly since the submission of Progress Report No 5 hence there is no change to the major components.

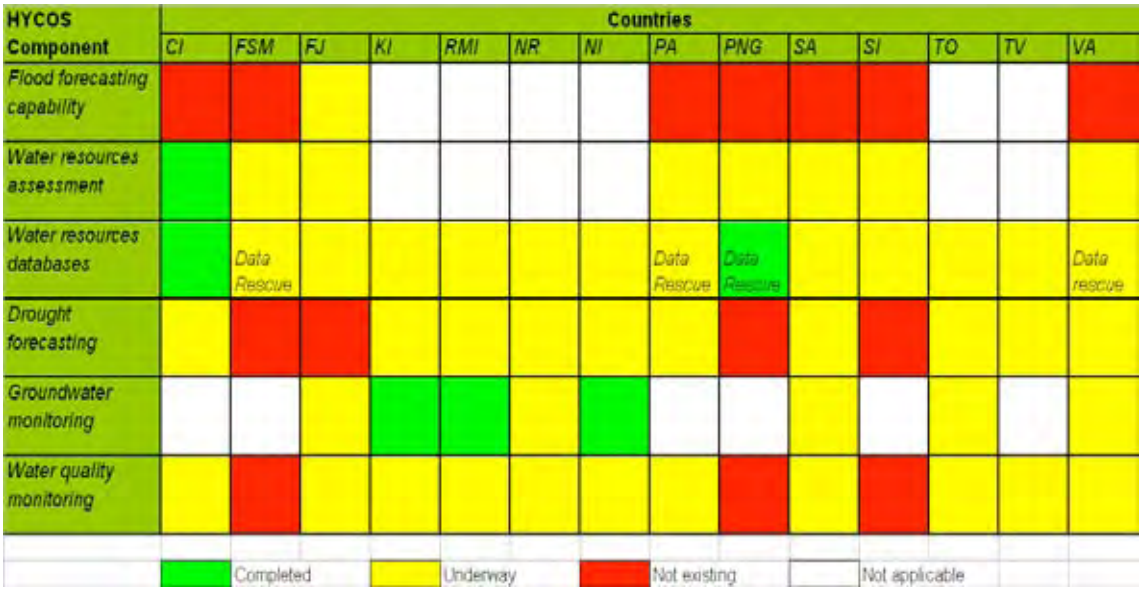


Figure 2.2: HYCOS Technical Components, relative progress to date

Whilst the field installations were mostly achieved in reasonable time under HYCOS support, the NHS enthusiasm and ownership has been difficult to extend beyond this due to poor management, leadership and recurrent resources. Perhaps in part, this is due to the aging and relative low skill base of the NHS work force and a poor level of commitment with reluctance to mobilise to the field for reasonable periods. The NHS's currently have a poor culture with regard to regular and ongoing field work and the issues pertaining to recurrent funding and transportation are not helping. Of necessity operational hydrology in the field especially given the time to travel to field stations, especially for installation and flood monitoring cannot operate on a 9am to 5pm basis. Often, these working hours preclude effective field work being undertaken. A field culture or field work ethic needs to be developed in most countries which establishes the importance not to take "shortcuts" in data collection and that it is important to regularly service sites for usable data sets to be developed. Often an additional hour or so spent on site can value add significantly to the field trip and subsequent data value by 100%. During missions the commitment shown by many of the NHS staff is outstanding, where they are work to get the job done,

however all to frequently when HYCOS staff departs the country, impetus is lost and the recommended program of tasks, ongoing field work and skill consolidation falters or stalls.

This is not uncommon in development work in the Pacific and HYCOS has addressed this where possible with longer term deployments of technical advisers to date to Tuvalu, Niue, Kiribati, RMI, and Samoa. This arrangement has assisted in developing regular and ongoing water resource monitoring and data management in the short term and is a useful model for future specific work to build sustained capacity. Whilst some individual staff members may have a good level of ownership of their specific role, this is generally not transposed to the NHS itself and support and material rewards for staff initiatives and remote work appear weak. HYCOS has where possible supported country staff initiatives with both technical and financial assistance, and will continue to promote their initiatives.

2.2.8 Instrumentation and equipment supplied

There has been little deviation from the implementation plan for each country and in large all of the instrumentation for measuring stream and groundwater levels, streamflow and rainfall has been purchased. In some cases there has been some variance where equipment is already in country or was seen to be not useful at this stage. The sneak preview of the NHS stocktake indicates that all NHS's see the equipment and technologies supplied as being advanced at the appropriate technological level.

Figure 2.3 presents the total amount of monitoring equipment sets purchased and installed to date. It is evident from the streamflow component that whilst 26 stations have been installed, no streamflow rating curves have yet been fully developed and then only for low flow segments. In most cases, few discharge measurements have been done in order to achieve this, even for low flows. No medium flow or flood measurements have been undertaken at all in any of the 8 surface water countries.

COUNTRY	Rainfall					StreamFlow				Groundwater		WQ
	Manual	Auto	Installed	Pending	Telemeter	Installed	Pending	Telemeter	Rated	Refurbished monitoring bores	Loggers	Bacteriological
Cook Islands		4	4			2			no			no
Micronesia		3	3			2	1		no			no
Fiji		6	6		6	5		5	no		5	no
Kiribati	15*	1	1	15					NA	11	1	yes
Marshall Islands	5	1	1	5	1				NA	11	3	yes
Nauru		1		1					NA		*RWH*	yes
Niue		4	4						NA	3	3	yes (H2S only)
Palau		6	5	1		3	1		no			no
Papua New Guinea		6	2	4		3	5		no			no
Samoa		11	5	6		3	2		no			no
Solomon Islands		6	4	2		3	1		no			no
Tonga		1		1					NA		3	yes
Tuvalu									NA		*RWH*	yes
Vanuatu		7	2	5		3	1		no			no
Totals		**57**	**37**	**40**	**7**	**24**	**11**	**5**		**25**	**15**	**6**

Note: rated means have streamflow ratings been established for low flows and/or floods
15 - a total of 18 raingauges purchased, 15 to be deployed to specific sites, 3 to be available as spare or where an additional site is required.*

Figure 2.3 - HYCOS equipment installed to date

2.3 Country Activities

This section briefly describes the works achieved during this 6 month period and what is intended to years end. Generally the works achieved were in line with the earlier work plan outlined in Progress Report No 5. Ongoing delays have occurred during implementation due to both country ability to absorb the technologies and for the PMU to be present to ensure activities are carried out. The PMU has by necessity focussed on those countries which are best able to support project activities. The work plan to the middle of 2010 is included in Section 4.

2.3.1 Cook Islands

Progress in the country continues to be mostly positive. A consultant was engaged in June to provide country inputs to consolidate activities, complete raingauge installations and report on the database with basic analysis. The database has been comprehensively checked and updated with analysis of all the data undertaken, thereby providing a status of the islands water resources. Due to the good quality data and long term datasets with few gaps, this is the only country where this is currently possible. No additional HYCOS mobilisations to the Cook's are proposed as the HYCOS initiatives are seen to be approaching reasonable sustainability subject to placement of the NHS within an appropriate agency and the staff remaining committed.

2.3.2 Federated States of Micronesia

Implementation in FSM on the Island of Pohnpei commenced in mid July with a consultant engaged to supervise the activities and undertake training over a 3 weeks period. Two streamflow stations and raingauges were installed on the Nanpil river. In December the final station was installed on the Senipehn river including a raingauge. Due to the compact nature of the island and a good level of recurrent resources, including a vehicle, the prognosis for a good standard of ongoing field works and sustainability remains good. .A program of regular discharge measurements at all flows is now possible and needed, however this is proving difficult to achieve. The main HYCOS demonstration catchment of the Nanpil is also the same as for the IWRM program. The next visit is scheduled in April 2010.

2.3.3 Fiji

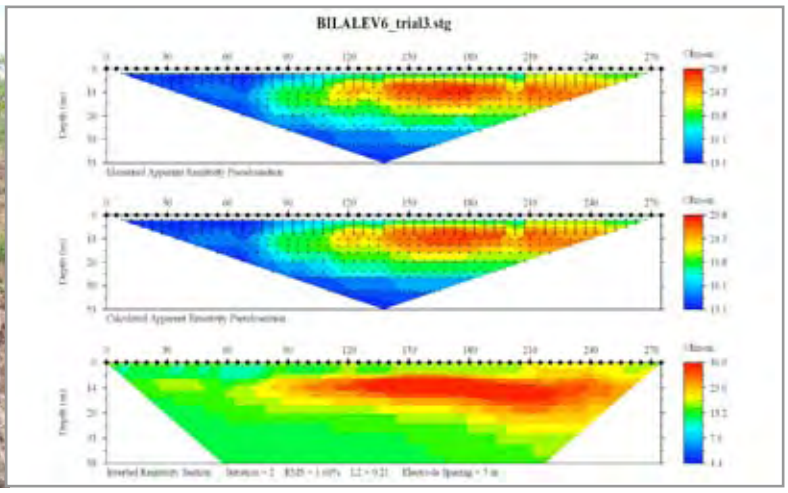
Surface Water - Full implementation in Fiji still remains difficult with the issues of uncertain placement of the NHS and lack of resources still apparent and impeding full implementation. HYCOS has maintained a high level of support to the NHS here with regular contact and support. It is observed that for operational support and longer term sustainability, Fiji Hydrology would be better placed with the Fiji Meteorological Service and not within a water supply utility. Recommendations have been made to Fiji Government on this matter with little traction to date. This has been through ongoing briefings and presentations to the highest level of Government. The HYCOS funded Rewa FFWS and EDF8 funded and HYCOS supported Navua FFWS are still not fully operational due to the continued lack of resources, communication issues and poor commitment to the project. Indications are that the National Hydrological Service functions have passed to the Water Authority of Fiji WAF (a corporative water supply entity) with no clear indication if there is a national responsibility or mandate for collection of hydrological data. HYCOS is providing assistance with the installation under IWRM GEF funding of a flood measuring system for the Nadi River to be commissioned early in 2010. The capacity and commitment of the NHS staff to measure floods still remains extremely compromised. A HYCOS 'big day out' field exercise was held in September on the Navua River to demonstrate the flood warning stations to stakeholders and the media and the use of discharge measurement equipment, Fiji TV was present and the coverage was broadcast nationally in an attempt to give greater visibility for hydrology in Fiji.

Photograph 1: river gauging equipment for flood measuring being used at Sabata Navua River

Photograph 2: Fiji One TV interviewing local staff at Sabata flood warning station, Navua River

Groundwater – In November 2009 support to Fiji's Mineral Resources Department to undertake a resistivity survey with was provided to assist with their ongoing investigations into the hydrogeology of the Sigatoka Valley. The week survey provided Fiji MRD staff the opportunity to gain first hand experience in the planning, preparation, field work and analysis data associated with resistivity surveys. Continued support will be provided as required through 2009 and into 2010.

Photograph 3: MRD and SOPAC staff gaining first hand experience with Super sting resistivity equipment. Sigatoka



Photograph 4: Output from Supersting resistivity equipment to help identify possible water bearing zones and test hole locations

2.3.4 Kiribati

Support for WEU was provided remotely during the later part of 2009. A mission is expected in 2010 to assist with the ongoing groundwater monitoring and in particular data management and analysis and will be coordinated with the planned activities under the KAPII project to avoid over stretching limited staff resources in WEU.

The remaining activity, which is a joint activity with the KAPII project and Kiribati Meteorological Service, will be a focus for 2010 implementation, with the installation of manual raingauges and training of water technicians on outer islands to collect this data. Continued support to monitoring of the groundwater resources of Bonriki is expected in 2010.

2.3.5 Niue

The implementation of proposed HYCOS activities in Niue are in the most part complete. HYCOS facilitated and supported activities with a professional engineer to assist in implementation and water management activities. No further progress has been made on the proposed groundwater status report for Niue. In part due to the continued focus by staff in Niue on other projects including the construction of new pipelines from the bores to storages and IWRM demands in addition to have had limited time to provide support on the report.

2.3.6 Nauru

A mission to Nauru in June 2009 focused on the delivery of the rainwater harvesting database and GIS to Nauru Government. A follow up mission in November 2009 was undertaken for delivery, installation and training of the IDEXX bacteriological equipment Colisure. A water quality monitoring component was established which looks at sampling potable water provided to the community by the Nauru Utilities Authority at various points along the supply line, to identify areas at most risk and any seasonal impacts associated with water quality. Sampling will take place monthly and protocols were suggested to look at action required in reporting of results to NUA and where E coli results are considered high. Sampling of selected rain tanks and community tanks were included in the water quality monitoring program. Follow up is expected early in 2010 including deployment of a post graduate hydrogeologist for 8 weeks to consolidate activities.

Photograph 6. calibration by ARMS personnel of the recently installed TB3 automatic rain gauge. NRC Workshop Topside

An automatic tipping bucket raingauge was successfully installed at the NRC workshops "Topside" with staff from the Nauru based ARMS project. Training in the installation calibration and download of the rainfall data was undertaken. The ARMS staff are successfully downloading and returning data to HYCOS. Additional ground truthing for the rainwater harvesting database and training was undertaken.

2.3.7 Palau

Progress in the country continues to be extremely positive with a good operational hydrology and water quality sampling program being maintained. A final streamflow station was installed on Babeldaob's largest catchment, the Ngermeskang Stream in December. This completes the HYCOS funded network with 4 streamflow and one lake level measuring station including raingauges. Mobilisations to Palau will be continued to further develop the capacity in the team who are lacking on many of the necessary skills. This is especially in regard data processing and analysis and how this data can be presented and used for water resource management purposes. Palau is approaching a degree of sustainability, subject to developing the team skills especially in the development of streamflow rating curves as they have never worked in operational hydrology prior to Pacific HYCOS. The next visit is scheduled in April 2010.

Photograph 5. Water quality sampling from concrete cistern used for drinking in "Location" Nauru.

2.3.8 Papua New Guinea

Only one visit was made to PNG this year due to the poor level of support and commitment from the NHS which is based in Port Moresby. Ongoing issues include institutional, funding and transportation problems. Field instrumentation and equipment were supplied in late 2008 but institutional issues still largely preclude site installations or regular field measurements commencing to date with most equipment still being in storage. The project was initially being implemented by the Water Resource Management Branch, (WRMB) of Department of Environment and Conservation which underwent internal institutional restructuring in 2008. Hydrology was reassigned to Environment Protection, Regulatory Services, Environmental Audit and Risk, this has moved far away from a desirable NHS despite HYCOS's recommendations otherwise. The EDF8 funded Ramu River sites are not fully commissioned after 2 years and a large investment is necessary in training and capacity building in Goroka and Port Moresby

Photograph 7: programming up completed Ngermaskang station

Photograph 8: installing Ngermaskang rainfall gauge

with further training in river level monitoring equipment and techniques. HYCOS assistance in 2010 will now be very limited. Options of partnering with PNG Power, the major electricity generator in PNG has not really advanced despite their continued need for hydrological data. The GS1 station in the Laloki catchment, the first ever installed in PNG in the 1950's, was recommissioned in June 2009 but WRMB have been unable to visit and download the data to date. Additional sites proposed for reopening later in 2009 did not progress due to the ongoing issues. The prognosis for 2010 seems modestly better with the EU B- Envelope program purchasing the NHS a robust 4WD vehicle, purchase of additional hydrological equipment is proposed and the hydrology unit intends moving to a separate office and store facility in Hohola. However this is all happening somewhat late for HYCOS initiatives to be best utilised. The PNG Focal point visited Suva in September 2009 and spent 3 days with the HYCOS PMU. In this time training was given to him in chart digitising, operation of Pumpro's, Hydrologgers, logging software and automatic raingauges as well as refresher TIDEDA training to enable him to commence these tasks on his return.

2.3.9 Republic of the Marshall Islands

An El Niño event was confirmed in mid 2009 resulting in an extended dry period of below average rainfall predicted for some areas of the Pacific. It was predicted that it could be come a moderate to strong event peaking at the end of 2009 or early 2010 and will be present until May 2010. RMI who were already experiencing below average rainfall in the early part of 2009 and subsequent reduced storages leading into this event were informed that further water stresses could occur. In consultation with RMI government a community focussed brochure was developed in October 2009 to assist with informing the community of El Nino weather patterns in the Marshall Islands, how it might affect them and what they can do to prepare for predicted water shortages and reduce water consumption.

A schedule of monitoring requirements and summary of monitoring procedures was developed with RMI EPA in 2009 . Ongoing support for data collection and transfer to HYCOS PMU will be a focus for 2010.

2.3.10 Samoa

Samoa continues to lead the way in terms of project implementation. The MNRE Hydrology Unit, effectively the NHS, is continuing the customer driven expansion of the monitoring network at pace with numerous new flow and rainfall sites being installed over the last 6 months. The major concern is that this sudden increase in workload for the MNRE hydrology section is placing stress on the relatively young and inexperienced team, restricting the opportunities for the development of necessary work procedures, quality and standards. Pacific HYCOS will continue to supply as able, a high level of support for the team in order to help them realise their goals. Groundwater monitoring issues are largely being covered by the EU WaSSP project which is funding the expansion of the monitoring network through the drilling of new boreholes.

The engineering hydrologist engaged by HYCOS for 3 months earlier in 2009 has been re-engaged by MNRE under Australian Volunteers International program for a 12 month contract. This placement is of extended value consolidating on work so far and maintaining a full time presence within the team to drive project goals and provide mentoring. Such placements would pay dividends in all PIC's should suitably qualified personnel be found to undertake them.

Operational support and capacity building has continued through the second half of 2009 with a 2 week mobilisation by HYCOS staff consolidating field installations and measurement techniques and the establishment of sustainable data management practices. Training missions are planned for March aimed at implementing office procedures and consolidating on field techniques, including flood measurement as possible. Additional mobilisations in late 2009 were not possible due to the devastating effects of the Tsunami experienced in September resulting in huge loss of life and damages. A flood measuring workshop is proposed in June.

2.3.11 Solomon Islands

A more positive note developed in the Solomon's for implementation in early 2009. Following a HYCOS visit earlier in the year an independent consultant was engaged in May for a period of 3 weeks to supervise the installation of raingauges and streamflow stations on Guadalcanal. Four raingauges and one streamflow station were installed as well as training given in operational hydrology and databasing. Some staff were well committed to this task and keen to learn the new skills, however some key staff were absent and this has compromised skill absorbtion by those that should be there. Transport continues to be a major problem and options for vehicle sharing within the department are not working well. Planning is under way for the reinstallation of the Lungga river site at the Betikama College, a secure area and the Tina River for the hydropower group. At years end these installations have not progressed despite being easily achievable as both sites are relatively close to Honiara. A best attempt at the Tina installation was made by the NHS team, however it was of very poor quality despite HYCOS guidelines and training. It had been interfered with by the locals and would not sustain high flows due to the fragile nature of the installation. The insecure equipment left on site is highly vulnerable to damage unless it is secured as per HYCOS recommendations.

Groundwater monitoring has not progressed to date. HYCOS assistance to The Solomon's will now be minimal despite the need for ongoing capacity development in field operations, data processing and quality control and elsewhere as possible. The recent return of an Environmental Scientist to the NHS who has been studying at master's level in Australia for two years, has not greatly assisted in implementation activities and addressing some of the in-country issues.

2.3.12 Tonga

Fitting of flow meters for all he abstraction bores in the Mataki'eua well field continued over the remainder of 2009 undertaken by the Tonga Water Board.

Additional support from Pacific HYCOS was discussed with Tonga's focal point and it is proposed that in conjunction with the arrival of professional support under AusAID that HYCOS will assist in mid 2010 including the data analysis and compilation of groundwater data and information. This will include capacity building and data analysis with MLSNRE to assist with reporting on Mataki'eua.

2.3.13 Tuvalu

Support was provided with the RWH GIS database in October 2009 to assist with data management issues, ground truthing and additional training where there was a change in GIS operators.

The status report on Funafuti proposed for late 2009 is deferred until 2010. A brochure to assist community with understanding of potential impact of El Niño events and identifying rainwater harvesting maintenance practices and preparations to assist the community with drought management options was deferred at the advice of Tuvalu Meteorology until 2010.

2.3.14 Vanuatu

Project implementation in Vanuatu was largely deferred throughout 2009 at the NHS request due to ongoing institutional and resourcing issues. Staff availability and the lack of engagement from the project focal point has meant opportunities to travel to the country have been limited until recently. At the end of 2009 the long term Focal Point departed on study leave for 2 years of post Graduate study in Australia, this will be a significant capacity loss to the project as a skilled replacement is unlikely.

A 2 week HYCOS mission was achieved in August with three streamflow stations being installed on the island of Efate on the Tagabe, La Colle and Epule streams. Training was undertaken in the installation of equipment, use and maintenance of the new technologies supplied. A scheduled follow up mission to complete the final installation was not possible at NHS request in November and this has been rescheduled to February 2010. This will allow for the reinstallation of the Lape river station on Santo and the recommissioning of the Sarakata river station located within the IWRM demonstration catchment. Focus will then shift to the implementation of sustainable data management protocols and the preparation for the rescue of paper based data records however this is contingent on a positive situation developing within the NHS. After a slow start the outlook for project advancement in Vanuatu appears a little brighter however the departure of the focal point for 2 years study leave is of some concern in regard the skills he assembled. At a technical level, the staff are very keen to implement the project fully but ongoing higher level impediments have precluded this to date.

2.4 Developing ENSO event

Given the developing ENSO El Niño event throughout 2010 which is forecast to peak in June, all PIC's now have modest and growing capacity and appropriate equipment to undertake the necessary rainfall, streamflow and groundwater observations necessary to capture and monitor the onset and magnitude of such an event. This places them in a stronger position to consider this event with past events (subject to available data) and assess and anticipate trigger levels and appropriate responses necessary to maintain water supplies and better prepare for potential impacts.

Advice to water resource managers in general has been through the HYCOS newsletter advising water resource managers of the information sources available online from UNOCHA, BOM, NIWA, and NOAA.

2.5 Ongoing issues

The ongoing resource and capacity constraints in many NHS's especially the surface water countries in regard to recurrent funding for field operations continue to hamper effective progress being made in many countries. Access to motor vehicles, river transport, field stores, workshops, laboratories etc are improving only modestly at best. These issues have been fully described in the previous Progress Reports. Three years into the project, few NHS's have what could be considered reasonable access to suitable transport (ground and water based) or fuel budgets, some have none. Some NHS's are still not in a sound position to implement Pacific HYCOS beyond local pilot systems installed on nearby accessible catchments or aquifers. These issues compromise the collection of even basic data for water resources assessment let alone measurement of floods and droughts. The sustainability, exit strategy, and legacies of the project areas which were not clearly identified in the project design are an area in which HYCOS hopes to focus on in the next 10 months. The efforts made to date have been in most part well received, and the need for reliable and consistent quality of data is recognised across the water sector in all countries, but is not extended into action. The limited skills base, and geographic isolation requires continued regional technical assistance and support to help countries achieve their water resource monitoring, assessment, analysis and reporting needs. This along with improving the support for NHS's by governments demonstrating commitment and valuing the resources they rely upon will remain a focus for the final year of HYCOS. Support is slowly forthcoming in this respect from the IWRM project.

At the technical officer level, the NHS staff are very keen for training and capacity development opportunities, however the number of countries and the associated difficulties with field access hampers the capacity of HYCOS staff to service these countries to the degree that is necessary. In country expertise working alongside the country staff and deployed over a longer period with coordination from a regional centre is a more pragmatic and effective approach and where greater successes have and will been achieved in the future. Simple skill deficits such as poor computer literacy, electronics, construction, fabrication etc continue to hamper some officers and continued guidance, training and mentoring is essential.

The need to notify in-country representatives and National Authorizing Officers of HYCOS missions is a necessary protocol for all SOPAC missions. This requires letters to be sent to respective SOPAC country representatives prior to entering the country to ensure that they are aware of impeding visits, and to receive their formal agreement in return. Whilst HYCOS staff have adhered to this protocol there is concern that the impact or visibility of the HYCOS project is still insufficient to ensure uptake at the ministerial and NAO level. This is an area where HYCOS and especially IWRM are proposing to develop suitable communication strategies or leverage off existing projects to develop the exposure it needs to generate better awareness of the need for monitoring and assessment of water resources in general thereby hopefully achieving sustainability of the initiatives.

3. Risks and Mitigation

Initially, technical and financial risks to implementing the project were assessed as being low to medium with little difficulty being anticipated in managing them and any difficulty here has been manageable.

The most high to extreme risks related to the feasibility of building capacity and ownership within the NHS's, to the point that they are able and willing to assume responsibility for Project outcomes by the end of the project. The project document update in 2004, reduced this risk to low mainly due to the development over the subsequent 5 years of regional and national water strategies, Departmental, Ministerial and Head of State endorsement and championing of water issues, this thereby ensured that there was never a higher level of commitment to water management issues in the Pacific than there is now. This was subsequently incorporated in the Output Level Risk Assessments in the final project document. These risks have transpired into reality and continued and ongoing effort is being invested to better develop both commitment and country ownership through the initial Memorandum of Understanding, regular newsletters and some preliminary cost benefit analysis, as well as in country activities. Some countries have progressed relatively well in implementing some positive changes within the NHS such as in Samoa, others however are not as well placed and several of them are still in a state of uncertainty in regard where their NHS institutional placement will finally be. Currently Fiji, PNG, Vanuatu and the Cook Islands are in this position. Solomon Islands remains stable whilst Palau, Nauru, Niue, Tuvalu, Kiribati, Tonga, and FSM do not have recognized NHS's as yet and most of the groundwater countries come under some form of a public utility, environmental or geological government department or otherwise.

The benefits derived for government, industry and community from improved understanding of our surface and ground water resources requires far greater recognition by governments in the Pacific than is currently evident. Misplaced, poorly performing and under funded NHS's with correspondingly poor outcomes is indicative of countries current commitment to, and recognition of the value of water resources data. HYCOS recognizes that the appreciation of the value of this data by the countries to assist in economic, social and environmental development is still not there and will require continued and ongoing support beyond the life of HYCOS. In the remaining life of the project, HYCOS will continue to look at measures to promote visibility and linkages with existing projects and generate the country support required to enable collection of reliable and consistent water resource data sets. With the mobilization of IWRM GEF staff in each PIC, the regular convening of national water committees, greater communication and awareness, it is hoped that there will be growing levels of support for monitoring and assessment.

3.1 Mitigation measures

In the remaining time for the HYCOS project the following measures will be actively promoted to try to address some of the recurrent issues which continue to effect full implementation. To date, these have and will include;

- SOPAC management dialogue with ministerial officials and senior management in the NHS's in regard the ongoing institutional and recurrent funding issues through such avenues as the Annual Session, high level briefing papers, conferences etc.
- Attempts to raise donor awareness in the need for funding for recurrent support for water resource monitoring and assessment, Technical Assistance programs, detailed training and mentoring for each PIC.
- Partnering with EU/IWRM and GEF/IWRM in encouraging the need for hydrological data collection for water planning, management and infrastructure design, you can't manage what you don't measure.
- Maintaining mobilisations and capacity development as much as possible given staff, budget and time limitations.
- Focusing on focal points and their immediate staff for training,
- In recognition of NHS staff transfers, attrition out and retirements, encourage the need for recruitment and career paths etc to be put in place by the NHS's.
- Assist in development of work programs and budgetary advice.
- Ongoing reference to the NZAid/NIWA and other training material and responsive to any assistance request.
- References and access to WMO material and standard procedures.
- Circulating standard operating procedures for equipment, instrumentation and , techniques, refining and development of these as possible.
- Ongoing development of the HYCOS website (now 29,500 hits).
- Media coverage where possible, TV, magazines and news papers.
- Commencing collating information and data for a publication titled Catalogue of Pacific River Basins supported by HYCOS.
- Commencing collating information and metadata for a publication titled Scans of the Pacific Regional Hydrological Database.
- Development of Groundwater Status Reports.
- Consider options for methodology and funding options which will provide a pragmatic and effective approach to further support countries to develop their ability to measure, monitor and ultimately better manage their water resources. It is increasingly evident that to support and sustain project initiatives, donor funding will be required to sustain a Project Resource Centre in SOPAC Suva after project completion. The model for the proposed Project Resource Centre and potential source of these funds is still being considered, but longer term (3 to 5 years) funding stream and continued technical support to countries is seen as highly necessary and essential by both the Project Management Unit, Focal points and country representatives.

3.2 Changes introduced in implementation

The independent project technical audit undertaken in April 2009 was the basis for applying to the European Union for a no cost 18 month extension to the project which was approved in June 2009. It is hoped that this extension will allow the project implementation and consolidation stages to be largely completed for the countries best progressing, extending the benefits of the project in these PIC's. The extension will also allow the Project Sustainability Phase to be progressed and strategies in place to better sustain and advance HYCOS initiatives and objectives beyond the life of the project. This was followed by the EU ROM in which the EU undertook their independent evaluation of the project. Given the ongoing difficulties in regard completing implementation in the time left, HYCOS now intends concentrating on the countries of Samoa and Palau for surface water, Tonga, Nauru and Kiribati for groundwater and Nauru for rain water harvesting for concentrated delivery of assistance. This will allow for HYCOS initiatives to be demonstrated on better performing countries with some data products hopefully being produced by projects end. Limited assistance will be advanced to the other countries on an as needed and as possible basis.

In large, the project implementation plan has been adhered to by the PRC, be it delayed, and all NHS's have now received equipment and services in line with this. The project log frame remains unmodified to that presented in the project design document. Despite delivery of equipment, in many cases, over 18 months or more ago, for several PIC's their institutional situation has not allowed for full implementation, and then only in part. In some cases, equipment is still sitting in 'the store' and not out collecting data. For these reasons some scheduled mobilisations have not been possible. In the past 18 months it has also been recognised that additional services need to be delivered and material developed as described in Section 3.1 which were not considered in the project design. It is considered that these changes will allow in some way for increasing levels of visibility and ownership of the HYCOS systems to be undertaken by the NHS's.

A summary of the project log frame is presented in Annex 2,

4. Workplan for Period January to June 2010

4.1 Pacific HYCOS Work plan 2010 first 6 months

Ongoing effort is being invested in addressing difficulties and identifying mitigation measures to help address some of the recurrent issues enabling project deliverables to be better achieved. These have been identified in the communications strategy and discussed at some length. The priority tasks have been identified and ranked and are proposed to include the following;

SOPAC senior level dialogue

- SOPAC management dialogue with national representatives and senior management in the NHS's in regard the ongoing institutional and recurrent funding issues through such mechanisms as the Annual Session, high level briefing papers, conferences, country visits etc. The need for long term data collection needs to be further conveyed to them.
- Attempts to raise donor awareness in the need for some form of funding for recurrent support for water resource monitoring and assessment. Donor assistance to date has largely been focused on water supply, sanitation and community risk issues in regard climatic variation and adaption and generally not for long term surface and groundwater resource monitoring and assessment.

Other SOPAC program support

- Partnering with EU/IWRM and GEF/IWRM in encouraging the need for hydrological data collection for water planning, management and infrastructure design, especially within the GEF demonstration catchments, generally also the HYCOS demonstration catchments. This will be assisted now by the deployment of the GEF advisers in each of the PIC's promoting the philosophy of You can't manage what you don't measure.
- Encouragement of other SOPAC sectors and programs to recognize, support and promote the need for long term water resource monitoring and assessment.

HYCOS direct undertakings

- Scaling down on country missions and assisting the countries best exhibiting the capacity for completing implementation and consolidation.
- Continue remotely supporting focal points and their immediate staff as possible for ongoing assistance. The need for technical assistant programs, detailed training and mentoring for each PIC still needs significant in-country input but is not possible at this late stage of the project.

- Encouraging within the NHS's the need for staff retention, skill development, recognition of skill depletions given staff transfers, attrition out, retirements and the need for recruitment of young motivated staff, skill retention, defined career paths etc to be put in place by the NHS's.
- Continue assistance with the development of work programs and budgetary advice to assist in sustaining annual operational plans etc for HYCOS and national initiatives.
- Assistance in planning structures for agencies seen to have inappropriate placement for their NHS using WMO Guidelines of the Role Operation and Management of National Hydrological Services as a model (WMO Report No 2003, Operational Hydrology Report No 49, 2006).
- Ongoing reference to the NZAid/NIWA, equipment and instrumentation manuals, manufacturer's manuals and other available training material, effectively standard operating procedures.
- References and access to WMO material and standard procedures.
- Circulation of specific standard operating procedures developed by HYCOS, refining and development of these as needed.
- Ongoing development of the HYCOS website (now 29,500 hits).
- Ongoing support to the Fiji NHS as possible in technical assistance plus assistance in network design, staffing structure, professional and technical, needs and the development of field programs and operational costs. This will effectively form a model which will assist other PIC NHS's in developing similar operational plans and budgets allowing for a sound basis for submission of annual budgets to PIC Governments.
- Consideration for a change in focus following HYCOS, that under donor funding, a PRC delivers regular technical services to NHS's servicing HYCOS sites and trains and builds capacity as possible.
- Commencing an assessment of country implementation in regard, proposed, changed, delivered, outstanding, issues, actions for 2010 etc and beyond, country specific and will form the basis of annexes in the final report.
- Where there is some demonstrable benefit, consultants may be engaged to assist in the project consolidation phase in select countries.
- Consideration of how to best exit leaving a positive and growing HYCOS legacy and a pathway forward.
- Commence mapping out the structure of the final report.

HYCOS products proposed and underway

- Completion of the HYCOS and IWRM communication strategy which will assist in visibility and a more focused delivery, this will have bearing on the final work plan for the remainder of 2010 and a pathway forward.
- Submission of a NHS survey, effectively a stocktake of NHS capacity developed to date, lessons learnt effectively allowing for a pathway forward and beyond HYCOS this will have bearing on the final work plan for 2010, this survey will be collated, outcomes summarized and produced as a formal report by May 2010.
- Producing the publication titled Catalogue of Pacific River Basins supported by HYCOS, Final draft due in May 2011.

- Commencing collating information and metadata for a publication titled Scans of the Pacific Regional Hydrological Database. Final draft May 2010.
- Preparation of a glossy handout on the raindrops to GW and streamflow principle, and how hydrological data is colleted.
- Development of Status Reports for selected groundwater countries.
- Preparation of a handout on why we collect data, what is involved and how is it used.
- Development of country posters on HYCOS achievements.
- Ongoing development of visibility material as possible on the need for the collection of hydrological data. It is difficult however to demonstrate this in the Pacific sense due to the lack of quality data for analysis and meaningful products especially for use in adaption for climate variation and change.
- It is hoped that there may be some more substantial measured datasets available from the key PIC's in the final 6 months of the project in which some demonstrable products may be able to be produced in regard droughts and floods and presented then.

The workplan has been presented in two parts, home office inputs in Table 4.1 and country missions in Table 4.2. It has in part been based on available funding and supporting the better advancing countries and in home office activities necessary to develop material necessary to support consolidation and sustainability.

HYCOS - Work Plan (home office) January to July 2009

Task	January	February	March	April	May	June
Progress Report No 6			submit			
Workplan		Finalise				
Communication Strategy		Draft	Final			
NHS Survey stocktake		analysis	Final			
Catalogue of Rivers		Draft	Final			
Groundwater status reports			Draft	Final		
regional database report			Draft	Final		
How hydrological data			Final			
Why hydrological data				Final		
Mapping out final report				Commence mapping content, format and initial preparation		
General visibility issues	ongoing					end
Commence CIP reviews						ongoing
Progress Report No 7						Prepare & submit
Exit strategy and legacy						Finalise & prepare

Table 4.1: Work Plan Home Office January to June 2010

HYCOS - Work Plan (missions) January to July 2009

Country	January	February	March	April	May	June
Cook Islands	No additional missions proposed					
Fiji	Fiji Hydrology inputs & assistance as possible					
FSM				1.5 wks		
Kiribati		1 wk				
Nauru			2 wks B Env			
Niue	No additional missions proposed					
Palau				1.5 wks		
PNG	No additional missions proposed for HYCOS				B Envelope	
RMI					0.5 wk	
Samoa		2 wks		1 wk		Flood w'shop
Solomon's					maybe	
Tonga					maybe	
Tuvalu	No additional missions proposed					
Vanuatu		2 wks	1 wk			

Table 4.2: Work Plan Missions January to June 2010

4.2 Communication strategy

The HYCOS/IWRM communications strategy has been developed in draft form and will be reported on separately. In large it develops a methodology and time frame to attempt to advance significant issues which have been identified that are impeding implementation, consolidation and sustainability as well as continuing to hamper the IWRM GEF implementation. This is being developed in consideration of the communications needs and strategy for EU and GEF IWRM and that these programs will continue beyond HYCOS and again advance the need for hydrological data.

As the GEF advisers are engaged and mobilise country specific communication strategies will be developed to further raise awareness for water resources monitoring and assessment and especially the need for this data for the HYCOS and GEF demonstration catchments. Once underway with meaningful data being collected more convincing case studies can be prepared and used at a stakeholder and a political level to garner greater levels of support. Whilst catchment management issues remain a high priority, it is hoped that also some cost benefit analysis can in time be developed especially in regard water related engineering infrastructure. This would clearly demonstrate the cost savings to be made if structures can be safely engineered and economically designed. The relative weakness of the NHS's and poor access to higher levels of Government currently preclude effective communications progressing. Where effective communication is possible it is mainly at a stakeholder and NHS staff level and engaging local media as possible.

More traction has been possible with media material such as compelling stories where public health issues are prevalent especially with delivery of potable water and sanitation. However for hydrological information not relevant to public health, less traction has been possible and it remains very difficult for NHS's to source support, funding and resources for data collection which is not seen of immediate or near term benefit with but coming with recurrent costs.

For the SOPAC Annual Session in October, a large format A1 size generic poster was developed demonstrating the aims and achievements of HYCOS to date. This was a big hit generating very positive comment and has been used in mini conferences since. This is to be migrated to specific country examples containing photographs of actual installations, achievements, sample data etc and published in A3 size for general distribution. Also table drink coasters were printed up and used at the Annual Session tables and will be used for any future significant SOPAC conferences and events.

4.3 Life beyond HYCOS

Throughout 2009, most NHS's on their own account have expressed concern in regard to the sustainability of their systems after the HYCOS project is completed. Questions have been raised such as: "how can capacity development be continued and the HYCOS initiatives be sustained and further developed?".

There are only few countries in a position to sustain their National Hydrological Service which still require increased support in terms of human and financial resources, even to operate the HYCOS sites at an acceptable Pacific level of operation and sustainability.

A preview of the responses to the NHS Stocktake survey (March 2010) show that many NHS's are well aware of the impediments and constraints they have, including poor resourcing, management, leadership and lack of political will to fund water resource monitoring and assessment. With an increased need for assessments and monitoring in the face of climate change and no regrets adaptation measures, it is essential that countries fully investigate and tap into future mechanisms of climate adaptation funding to bolster their NHS capabilities especially in regard data collection.

Only where water sector reforms resulted in an improved institutional arrangement for monitoring and assessment in countries, such as in Samoa, adequate resourcing has been forthcoming for the

NHS including human resources, training, specific budget and recurrent resources.Other avenues of support, including through bilateral programmes, need to be investigated to support HYCOS initiatives until the NHS's are in a stronger institutional position.

As water sector reform and institutional strengthening for the sector is underway through the Pacific Infrastructure Facility or EU EDF10 programmes or budget support, opportunity needs to be uplifted here by the NHS's. However due to the time frames for any donor assistance to be put in place and come on line, short term support funding is seen as essential to sustain the PRC and national data collection and database systems as implemented under HYCOS.

4.4 National vs Regional support

A regional facility can be retained at the Project Regional Centre to provide continued support to NHS's in terms of assessing further needs, technical assistance with the network and data collection, archiving and analysis and backup storage through the Pacific HYCOS Regional Database.

Sustainable operation of the HYCOS stations and data products will in time becoming available for assessing the base line data for climatic change and adaption. If this approach can be advanced it is possible to investigate options then for expansion of the monitoring networks.

Indications over the life of HYCOS show that the NHS's are still extremely weak in their capacity to monitor their water resources. Until they are better supported through National Water Policy and institutions, a commitment to act and well funded for human and recurrent resources, capital investment, training, the likelihood of attaining sustainability is questionable. For these reasons, other avenues of support need to be investigated to support HYCOS initiatives until the NHS's are in a stronger position to undertake these works and grow the system from one of pilot systems to one of national coverage.

Options beyond the life HYCOS have been discussed and could include various forms of assistance all of which would require retention of a Project Regional Centre located in a major Pacific hub with a sustainable funding stream. Any initiative would need to be undertaken with the full mandate and support of the respective NHS, one of a bilateral assistance program. These would provide interim measures ensuring sustainable data collection is achieved from the pilot basins and aquifers, until the NHS's approach a self supporting situation. The buddy system is fully supported through these options where country staff develop rapport with the expert in country and via on line support and mentoring. These are discussed briefly a) through c) below;

a) Undertaken very much the same as for the current HYCOS to sustain a PMU mobilising specialist staff and consultants to the PIC's on an as needed basis but still involving country Focal Points and their staff, to further develop their skills and supervise the ongoing monitoring works.

b) A Technical Assistance program implemented in each country, along the lines of the EU GEF project undertaken under the umbrella of the PRC. Funding would need to be secured to enable an international expert to be mobilised for a minimum period of at least 12 months in each country, leading and managing the local staff, training and developing capacity. A fully funded in country operational budget would be necessary. The expert would need to be well skilled in the field of operational hydrology.

c) The PRC mobilising experts (PRC staff or consultants) to each PIC at least four times annually for minimum periods of two to three weeks supervising works, developing capacity, using and developing in country resources as possible

d) PRC engagement or partnering with a reputable New Zealand or Australian water resource agency where PIC staff can attend 3 month work experience postings and the agency staff are seconded to the PRC for varying periods to undertake capacity development and supervision of in country monitoring works.

5. Financial Summary for Activities Undertaken

The activities undertaken above have been summarised into the following classifications and compared with projected budgets initially proposed.

The financial summary is from July 2006, the commencement of the contract. Project commencement was delayed until December 2006, some six months after the contract date and the period of financial reporting.

The Third Tranche of funding EUR 732,763.93 (90% of final tranche) was received July 2009. A request for a "no cost" project extension was applied to and approved by the EU delegation, on 09th June 2009.

Future financial reporting for the remainder of the project will report against the total projected expenditure of the project.

Table 5.1 Project Expenditure

First Tranche Payment received European Union	€611,101
Second Tranche Payment received European Union	€1,099,648
Third Tranche Payment received European Union	€732,763.93*
Total Payment received European Union	€2,443,513

Expenditure Activities	Actual 6 Month Expenditure June 2009 – December 2009	Projected Expenditure July 2006 – December 2009 (A)	Actual Expenditure July 2006 – December 2009 (B)	Expenditure Difference July 2006 – December 2009 (A-B)
Salaries	113,122	612,445	611,236	1,209
Consultancies	127,742	459,871	308,497	151,374
Travel	20,932	409,013	299,394	109,619
Equipment Transport, Supplies	884	40,830	45,676	-4,846
Monitoring works	93,856	752,125	718,620	33,505
Local office Costs	1,015	10,315	7,494	2,821
Other Costs, services	3,621	23,638	25,519	-1,881
Administration	21,711	106,730	128,950	-22,220
contingencies	NA	110,004		110,004
TOTAL	€382,882	€2,524,970	€2,145,386	€379,584

* Note that this relates to 90% of the third tranche EUR 814,198. The remaining funds Eur 81,434 to be provided on finalisation of the project in 2010.

Salaries = *Salaries for SOPAC staff attached to Pacific HYCOS.*

Consultancies = *Fees attached to engagement of contractors/subcontractors and consultants.*

Administration = *Administrative costs including maximum of 7% of costs of Actions and office supplies consumables.*

Travel = *Perdiem and transportation (airfares, etc) for HYCOS staff, conference participants, and consultants.*

Equipment, Transport, Supplies = *Includes computers, and incountry transport and spare parts required for project.*

In Country Monitoring works = *All hydrological equipment purchased and installation costs for country activities, including freight.*

Local Office costs = *office supply consumables, tel/fax electricity, maintenance.*

Other Costs = *Auditing, Website production, publications, financial services, conferences seminars and visibility actions.*

Annex 3 a) provides a detailed summary of the expenditure for the period July – December 2009 for Pacific HYCOS. An independent audit of the financial year 2008 - 2009 expenditure was undertaken in October 2009 and presented as Annex 3 b).

Co-funding SOPAC Partnered Contribution

The Pacific HYCOS project has identified a total cost of the Action is estimated at €3,524,970. The EU contribution undertakes to finance a maximum of €2,524,970. The SOPAC partnered contribution is €1,000,000. The SOPAC contribution has been separated into a Preparatory Phase May 2004 – December 2006, and the Operational Phase, December 2006 – December 2010. This was agreed to by the EU delegation in June 2009, addendum to the contribution agreement.

The cost incurred for the SOPAC partnered preparatory phase activities is €617,756 for the period May 2004 to December 2006. This preparatory phase was an important precursor to the commencement of the main project, ensuring that the PICs were provided with opportunities for technical training and facilitating access to climate and water resource information. During the 2007 -2008 period year the co contribution from Regional Water Quality Programme was €224,586 (0.3475). During the 2009 year the co contribution from Regional Water Quality Programme from available information is ($211,519.57 FJD) €81,694 (0.3862) Refer Annex 3 c). During 2009 there has been additional activities and expenditure undertaken by SOPAC and its partners which contribute to the Pacific HYCOS objectives and co funding. These include the Island Climate Update project (a monthly information brochure with climate and rainfall synopsis distributed widely in the Pacific) and Historical Climate Data Rescue project (digitizing of available climate data from paper records for PICs) which had expenditures of €110,095 and €44,845 respectively. It is expected that these latter projects will be completed and have their final acquittal in June 2010. Refer Annex 3 d).

Total cost incurred for the SOPAC partnered co contribution activities for the period May 2004 to December 2009 is €1,078,976.

The budget summary for the 3 years of operation January 2007 to Dec 2009 indicates that expenditure in most cases was in line with the original budget. Savings made in bulk purchases of equipment have meant that equipment has been delivered in accordance with the original document and at times exceeded the number of stations originally proposed.

The ability for the project to continue towards consolidating its deliverables at no additional cost was the result of savings made in travel and use of consultants. Savings were made with use of supervised attachments, junior professionals and making use of established capacity building programmes (PACTAM) to place professionals in country for two year periods. It is these saved funds and the remaining €81,434, the balance of the third tranche, that will be used to fund the additional operational year of the project. The focus for 2010 will be to work with country counterparts on the consolidation of monitoring and assessment activities, data management practices and analysis of water resource data, and sustainability of the project objectives.

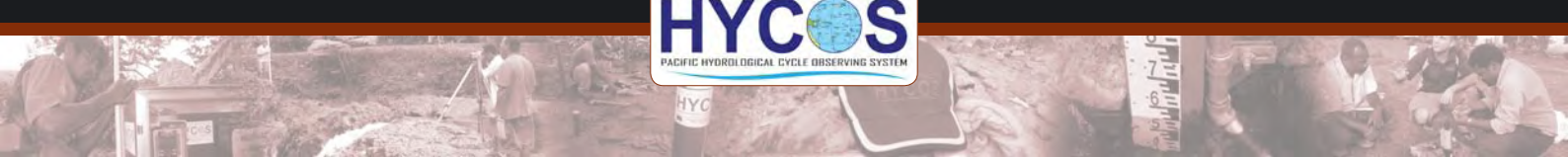
The funding of equipment and large implementations is mostly complete. Provision in 2010 is made only for small outstanding equipment needs and sufficient funding for implementation of remaining activities.

LIST OF ANNEXES

February 2010

ANNEX 1

EU ROM REVIEW



Monitoring Report

Monitoring reference	MR-124444.01
Report date	01/10/2009
Project title	FIJ - SOPAC - PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM (H

I. Intervention data

Status	FINAL
Monitoring Report Type	Ongoing
Aid Modality	Project approach
Project	Multi Country / Regional Project - Consolidated/Horizontal Report
Project Management	Project managed by the Delegation (devolved)
Financed via a thematic budget line	No
CRIS Number	C-193508
Project Title according to Financing Agreement/Financing Decision	Pacific Hydrological Cycle Observing System (HYCOS)
Domain	European Development Fund
DAC - CRS Sector	-
Additional DAC - CRS code	14010 - Water resources policy and administrative management
Geographical zone	Pacific Region
Keyword (for innovative interventions)	
Date Financing Agreement/Financing Decision/Contract signed	22/06/2006
Person responsible at HQ	n/a
Person responsible at Delegation	Adrian OANCEA
Monitor	Ueligitone SASAGI
Project Authority	SOPAC
Type of implementing partner	International governmental organizations (non UN)
Start date - planned	22/06/2006
End date - planned	22/06/2009
Start date - actual	22/06/2006
End date - likely	31/12/2010
Monitoring visit date	from 31/08/2009 to 15/09/2009

II. Financial data

Primary commitment (EC funding)	2,524,970
Budget allocated for TA	1,502,000
Secondary commitment (funds contracted of EC contribution)	2,524,970
Other funding (government and/or other donors)	1,000,000
Total budget of operation	3,524,970
Total EC funds disbursed	2,443,550
Financial data on	25/09/2009

III. Grading

Relevance and quality of design	B
Efficiency of Implementation to date	C
Effectiveness to date	C
Impact prospects	B
Potential sustainability	C

IV. Summary of conclusions

Relevance and quality of design

The aims of the project are to establish the human and institutional capacity in 14 participating pacific countries in assessing the status and trend of their water resources; and provide adequate warnings of water related hazards by providing relevant equipment and resources for capturing data for weather monitoring. Needs of the 14 participating pacific countries have been specifically articulated in the Pacific Regional Action Plan on Sustainable Water Management Plan, 2003 and the project objectives have been focusing on these needs. The expected results are the development of capacities within the participating countries in flood forecasting, surface water management, database design, drought forecast, groundwater management, water quality, and project management; these are clear and logical. The project considered seven output components including flood forecasting capacity, surface water management, database design, drought forecast, groundwater management, water quality, and project management. The risks associated with these components include the difficulty of identifying catchment areas, the country's ability to provide basic requirements like reliable power supplies, radio channel, access and security, etc. Risk assessments have been incorporated as part of the project design. The participating countries have attended two Steering Committee Meetings in 2006 and 2008. Memorandum of Understanding between SOPAC and all these countries was signed in mid-2008 which demonstrates their support. It also demonstrates that the stakeholders have been consulted through these meetings. Consideration has also been given to the effects of the project activities on the environment, gender, human rights, donor coordination and local governance. However, the design could have been better if cultural and socio-behavioral issues in different pacific countries were fully assessed and considered.

Efficiency of Implementation to date

The deliveries of equipment for the collection of data for surface and ground water, rainfall and water quality to participating countries vary from country to country. Rain gauges are still sitting in Kiribati Met-Service store-room because of funding issues; flow meters were sitting in Tongan Custom for about two months because of misunderstanding in the status of the equipment; and instruments for groundwater measurement for Palau have not yet arrived. Vandalized equipment in PNG and Solomon has caused the delay in getting quality and reliable data. Despite hiccups in the delivery and installment of these equipment and instruments, they were procured and delivered at budgeted costs. Trainings for local technical staff for the installation and maintenance of equipment and instrument have not been carried out for all the participating countries due to the availability of appropriate technical personnel. Training for the analysis of data for the participating countries has not yet completed. Lack of cooperation has been observed in Kiribati, Fiji and Tonga in ensuring the correct procedures for using equipment and instrument and their on-going maintenance is followed as agreed in the MOU.

Effectiveness to date

Lack of capacity and high turnover of relevant staff, ad-hoc statutory frameworks, institutional fragmentation, lack leadership, lack commitment, and lack of enthusiasm have led to poor water data collection and recording. Observations in Kiribati and Tonga also revealed lack of coordinated ways of sharing the collected information and storing data. These issues will affect the results of the project. The delay in the installation of water equipment in Niue, Palau and outer islands of Kiribati will also affect the quality of data collection. Concerns have been raised by some countries about the ability of local technical staff in analyzing the water data. The problem is also compounded by the high turnover of trained staff in participating countries. Trained technical staff that was capable of analyzing the data left the service for higher rewards elsewhere. Overall, the access of the water information by local stakeholders is hindered by the lack of centralized databases where all the collected information are to be stored; and the ability of local technician to analyze the collected data. Data for water testing in Kiribati are recorded in a textbook and is transported from a testing

laboratory situated approximately 50 kilometers from the hospital laboratory where the data is to be analyzed. The data is then recorded in a piece of paper approved by the Health Director. There is no backup on this data. This data is only for organism. If the Public Utility Service needs tests on the water salinity, they will have to do them separately

Impact prospects

It is apparent that data from the project equipment and instruments have been collected and used by stakeholders in some participating countries. In Palau, Marshall Is, Tonga, and Samoa, data have been collected from the equipment and transmitted to SOPAC. Despite the ineffectiveness of data handling, storage and their analysis, there are signs of positive impacts of the project in water resource monitoring in the participating countries. The project objectives focusing on the needs of participating countries are likely to be broadly achieved despite the slow pace under which the delivery and installation of equipment are carried out.

Potential sustainability

Without an agreed exit strategy, there are likely to be some issues regarding financial and capacity sustainability within the target groups. The project design did not include an exit strategy. The questions regarding the replacement and maintenance of equipment and instrument, the provision of funds for the continuation of the project in local budgets, and capacity building for water resource management were raised with Kiribati and Tonga officials. Their responses were negative and could not provide for any sustainable management (finance and resources) of the project at the close-out phase. They considered seeking further aid fund to continue the project. Apart from Palau and Samoa who have incorporated resources and funds for the continuation of the projects, the majority of participating countries are not. Therefore the financial and resource sustainability of the project is in doubt. Most participating countries have low level of support and commitment to this project. The low level of commitment is compounded by institutional fragmentation and ad-hoc statutory frameworks supporting the delivery of water monitoring. Few participating countries have existing relevant national water policies where the implementation of the project can be channeled through. However, these policies are weak and may not be effective in enforcing data collection and their use. It is also essential for participating countries to be fully briefed on the project and its results so that they can support and embed the project outcomes into their respective structures. This could have been done at the initial project planning phase where detail studies on how each of the participating countries operate in terms of culture and socio-behavioral issues in their respective communities. This may have helped in framing the project design. Example is monarchy approach in Tonga; chiefly system in Samoa, and so on. The project is currently viewed by some participating countries as a 'paste-on' requirement for water monitoring. Due to the wide range of institutional fragmentation and ad-hoc legal framework for water resource management in most participating countries, it is difficult to embed the project into the local institutional set-up. For example, internal differences between two institutions in Tonga as to who is responsible for the control of water resource.

Key observations and recommendations

Project design is generally good. The needs and capacity assessments of participating country is adequate and the logical frame demonstrates a clear response to them. However, the implementation and close-out phases of the project must have been better. Institutional fragmentations, ad-hoc legal framework on water, availability of relevant policies and strategies, cultural and socio-behavioural influences, and lack of commitment from the participating countries have affected the procurement and deliveries of resources and services in implementing the project. The absence of an exit strategy will also call into question the financial and capacity sustainability of the project.

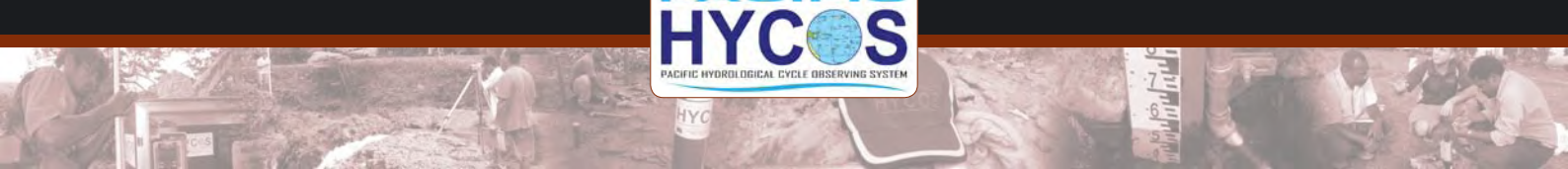
Project management: 1) Clear documented procurement and delivery of resources and services is agreed between PMU and each participating country. 2) Installed equipment and instrument are the responsibility of the participating country; vandalised equipment and instrument are to be replaced by the responsible country.

ECD: 1) More comprehensive and robust country capacity and needs assessment is required during the pursuit/planning phase of any future regional project. 2) Clear documented exit strategy should be part of the project design.

February 2010

ANNEX 2

PROJECT LOG FRAME



Logical Framework Of Major Project Components – Country By Country - Cook Islands

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not currently warranted in Cook islands, installed equipment is upgradeable when/if required and subject to suitable and reliable communications. Needs improvement of basic flood measurements and datasets to progress further. Difficulty in getting flood measurements undertaken, water supply focus.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	HYCOS sites (2) plus existing sites (3) largely complete the Cook islands network. This includes 6 recording raingauges. Operational practise is relatively robust with a good field program and QA/QC procedures implemented. Consolidation activities and data analysis essential. Fundamental to develop robust datasets here to progress the other project components. Future concerns over NHS placement
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Cook's has operated TIDEDA data base software for 10 years and has modest capacity in use of this. All hydrological data processed and backed up. A recent full review was undertaken on all of this data and analysis undertaken for stakeholders. More detailed training required in analysis and QA/QC processes and data presentation.
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Cooks has close to 10 years of good data with some gaps, it is now quite usable for analysis of low flow and periods. Staff lack the analysis skills to undertake this work, forecasting seen as a NMS function. Continued development of low flow datasets required on index streams.

5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Not yet developed, as Cooks advances to GW utilisation, this module can be easily developed using HYCOS technologies and existing software subject to available monitoring bores being constructed.
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	WSP has funded WQ equipment and training and WQ database. A modest WQ monitoring program is operation addressing public health issues. Stream sediment is not currently measured; equipment is available, laboratory not complete for analysis.

NHS Placement – currently comes under the Ministry of Infrastructure and Planning, Department of Water Works, pending restructure makes future placement uncertain

Logical Framework Of Major Project Components – Country By Country – Federated States Of Micronesia

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not currently warranted in FSM, any flooding is very "flash" floods. Installed equipment is upgradeable when/if required and subject to suitable and reliable communications. Needs improvement of basic flood measurements and datasets to progress further. Difficulty in getting the NHS to undertake flood measurements.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Implementation progressing slowly with 3 streamflow and 3 rainfall stations installed. Operational practise very basic with an erratic field program and QA/QC procedures being undertaken. Installations complete and consolidation activities and data analysis commencing. Fundamental to develop robust datasets here to allow progression of the other project components. Staff availability & skill issues have compromised implementation.
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	TIDEDA data base installed and limited data rescued from USGS database. More detailed training required in analysis and QA/QC processes and data presentation. Rescue of data from WERI and USGS needs to progress. Full reprocess of USGS data needed, data currently in secure storage in Seattle, USA . inaccessible !
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	FSM data held by USGS currently inaccessible. Staff lack even the basic analysis skills to undertake this work, forecasting seen as a NMS (NOAA) function. Continued development of low flow datasets required on index

					streams is highly essential.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Not yet developed. Potential for development of GW in Kolonia & Palikur areas for water supply, this module can be easily developed using HYCOS technologies and existing software subject to available monitoring bores being located or installed.
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	WQ monitoring not undertaken. Stream sediment is not currently measured; equipment is available. No laboratory facilities.

NHS Placement – does not exist; work previously undertaken by the US Geological Survey. HYCOS currently comes under Department of Transport, Communications and Infrastructure, GoFSM

Logical Framework Of Major Project Components – Country By Country - Fiji Islands

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Stations HYCOS (5) EDF8 (3) installed, system still not operational. Needs basic flood measurements, reassess historic data and datasets to progress further. Flood measurements are not being undertaken. NHS capacity precludes advancement, ongoing assistance to resolve the issues undertaken. Communications still nor working
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	HYCOS sites (5) largely complete for the Fiji islands network. Operational practise is very poor, erratic field program and QA/QC procedures are absent. Consolidation activities and data analysis essential. Fundamental to develop robust datasets here to progress the other project components. continued concerns over NHS capacity, placement and future
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Fiji has operated TIDEDA data base software for 20 years and has only basic capacity in use of this. Database review indicates it is in an appalling state. More detailed training required in processing, analysis and QA/QC processes and data presentation. Data rescue essential , full time TA investment needed here as poor NHS committment
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Fiji has poor and discontinuous data with many gaps; it is unusable for analysis of low flow periods. Staff lack the analysis skills to undertake this work, forecasting seen as a NMS function. Continued development of quality low flow datasets required on index streams.

5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Limited progress to date Not yet developed, as Fiji advances to GW utilisation, this module can be easily developed using HYCOS technologies and existing software subject to available monitoring bores being located or constructed. Recent resistivity work undertaken in Sigatoka for GW assessment
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	No WQ measurements are undertaken, no capacity or laboratory facilities. Stream sediment is not currently measured; equipment is available.

NHS Placement – Surface water currently comes under the Ministry of Local Government, Department of Public Utilities, Water Supply and Sewerage Division, pending restructure makes future placement highly uncertain . Groundwater monitoring comes under Mineral Resources Department.

Update February 2010, there was a wholesale transfer of staff and assets to Water Authority of Fiji in 1st January, WAF is a corporate identity, a mandate to operate as a NHS is very uncertain

Logical Framework Of Major Project Components – Country By Country - Kiribati

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not applicable – no surface water in Kiribati
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Not applicable – no surface water in Kiribati
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Kiribati groundwater data at a National level is currently stored in an excel spreadsheets which has been provided to HYCOS for archival in the regional TIDEDA database. Annual data reporting undertaken by Kiribati in 2008 and to be provided again in early 2010
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Kiribati Meteorological Service KMS is undertaking rainfall analysis using SCOPIC application which has rainfall prediction capability based on statistical methods. Additional support to KMS with supply of raingauges to improve coverage.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Quarterly groundwater monitoring is in place with trialling of monthly monitoring of major resource. Monitoring boreholes were rehabilitated and extensive training in the

			Groundwater Database records		collection and archiving of data has been provided. Annual report 2008 produced under HYCOS and 2009 annual report proposed. Data archived into TIDEDA
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	HYCOS has provided MOH with quantitative IDEXX bacteriological assessment equipment. Water quality monitoring program commenced in 2009. Salinity data from water resources is stored in TIDEDA.

Logical Framework Of Major Project Components – Country By Country - Republic of Marshall Islands

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not applicable – no surface water in Republic of Marshall Islands.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Not applicable – no surface water in Republic of Marshall Islands
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Republic of Marshall Islands groundwater data at a national level is currently stored in excel spreadsheets which has been provided to HYCOS for archival into the regional TIDEDA database. Groundwater data is being collected and archived by Republic of Marshall Islands Environment Protection Authority
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Republic of Marshall Islands Weather Service Office has installed under additional automatic and telemetered rainfall gauges which will be used for drought monitoring at the dominant water resource Laura
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Groundwater monitoring is in place and loggers have been deployed to key bores. Data archived into TIDEDA. Extensive training provided to staff in groundwater monitoring.

			Records		
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	HYCOS has supported the collection and archive of water quality data and bacteriological samples. Data has been archived in TIDEDA and support to the trialling of the water quality database in Republic of Marshall Islands in conjunction with the Water Quality Management project.

Logical Framework Of Major Project Components – Country By Country - Nauru

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not applicable – no surface water in Nauru
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Not applicable – no surface water in Nauru
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Rainfall data only is currently being collected by GoN. TIDEDA used to archive this data set.
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Nauru has had limited rainfall data collection. Installation and training with automatic rain gauge. Raingauge installation (1) and recording books provided.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Groundwater monitoring currently not undertaken. HYCOS to provide capacity to undertake initial groundwater inventory with GoN early in 2010. Recently installed monitoring bores monitored by Nauru

			records		Rehabilitation company
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	HYCOS has provided MOH with quantitative IDEXX bacteriological assessment equipment. Water quality monitoring program commenced in 2009. Data stored at MoH, and provided to Nauru Commerce Industries and Environment, and Water Utilities

Logical Framework Of Major Project Components – Country By Country - Niue

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not applicable – no surface water in Niue.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Not applicable – no surface water in Niue
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Niue groundwater data at a National level is currently stored in an excel spreadsheets which has been provided to HYCOS for archival in the regional TIDEDA database. Groundwater data is being collected and archived by Niue Department of Public Works
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Niue Meteorological Service is undertaking rainfall analysis using SCOPIC application which has rainfall prediction capability based on statistical methods. Installation of additional rainfall gauges to
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Groundwater monitoring is in place and loggers have been deployed to key bores. Data archived into TIDEDA. Extensive training provided to staff in groundwater monitoring.

			Records		
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	HYCOS has supported the collection and archive of water quality data. Data has been archived in TIDEDA and support to the trialling of the water quality database in Niue in conjunction with the Water Quality Management project.

Logical Framework Of Major Project Components – Country By Country – Palau

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not currently warranted in Palau. Installed equipment is upgradeable when/if required and subject to suitable and reliable communications. Needs improvement of basic flood measurements and datasets to progress further. Difficulty in getting flood measurements undertaken.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Implementation progressing well 4 streamflow, 1 lake and 6 rainfall stations installed. Operational practise is improving with robust field program and QA/QC procedures being undertaken. Implementation largely complete and consolidation activities and data analysis commencing. Fundamental to develop robust datasets here to allow progression of the other project components. Staff motivated and keen, limited but growing skills.
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	TIDEDA data base installed and all data rescued from USGS database. Most hydrological data processed and backed up through rescue activities. More detailed training required in processing analysis and QA/QC processes and data presentation. Quality of USGS data is reasonable for some basic analysis.
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Palau has some reasonable data, but very little data suitable for analysis of low flow periods. Staff lack the analysis skills to undertake this work, forecasting seen as a NMS (NOAA) function. Continued development of low flow datasets required on index

					streams is highly essential.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Not yet developed. Potential for development of GW in Arai Sate for Koror water supply, this module can be easily developed using HYCOS technologies and existing software subject to available monitoring bores being located or installed.
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	WQ monitoring not undertaken under HYCOS but EQPB have good capacity here with a regular sampling program and good laboratory facilities. Stream sediment is not currently measured; equipment is available.

NHS Placement – does not exist; work previously undertaken by the US Geological Survey. HYCOS currently comes under Environmental Quality and protection Board, GoP, possible restructure.

Logical Framework Of Major Project Components – Country By Country – Papua New Guinea

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Warranted in PNG, equipment when installed will be upgradeable when/if required and subject to suitable and reliable communications. Needs improvement of basic flood measurements and datasets to progress further. Difficulty in sustaining remote equipment and in getting flood measurements undertaken, vandalism risks high.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Implementation progressed very little due to ongoing institutional & capacity issues. Operational practise is relatively poor with an extremely limited field program and QA/QC procedures being undertaken. Implementation completion and consolidation activities and data analysis highly essential but are now very compromised. Fundamental to develop robust datasets here to allow progression of the other project components.
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	PNG has operated TIDEDA data base software for 20 years and has only modest capacity in this. Most hydrological data processed and backed up through rescue activities. More detailed training required in analysis and QA/QC processes and data presentation. Quality of data is very poor. Greater commitment to data rescue required of chart data etc plus training required.
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological	Participating country governments wish to proceed to establish a national drought forecasting capability.	PNG has substantial data, but very little good data with many gaps, it is largely unusable for analysis of low flow periods. Staff lack the analysis skills to undertake this work, forecasting

		forecasting	agencies.		seen as a NMS function. Continued development of low flow datasets required on index streams is highly essential.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Not yet developed. Potential for development of GW on Laloki Plains, this module can be easily developed using HYCOS technologies and existing software subject to available monitoring bores being located or installed and NHS interst.
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	WQ monitoring not undertaken. Stream sediment is not currently measured; equipment is available, laboratory facilities are not available for analysis.

NHS Placement – currently comes under the Department of Environment and Conservation, Environment Audit and Risk. Downgraded from previously visible placement as Bureau of Water Resources, then Water Resources Management Branch of DEC, future placement and support are still uncertain.

Logical Framework Of Major Project Components – Country By Country - Samoa

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Warranted in Samoa, installed equipment is upgradeable and subject to suitable and reliable communications. Needs improvement of basic flood measurements and datasets to progress further. Difficulty in getting flood measurements undertaken, slowly progressing.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	HYCOS sites (6) completes the Samoan network. This includes 13 recording raingauges. Operational practise is relatively robust with a growing field program and QA/QC procedures implemented. Consolidation activities and data analysis essential. Fundamental to develop robust datasets here to progress the other project components. Robust placement and operation, positive outcomes.
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Samoa has operated TIDEDA data base software for 10 years and has modest and improving capacity in use of this. All hydrological data processed and backed up. More detailed training required in analysis and QA/QC processes and data presentation. Significant data rescue activities achieved and ongoing.
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Samoa has limited good data with some usable for analysis of low flow periods. Staff lack the analysis skills to undertake this work, forecasting seen as a NMS function. Continued development of low flow datasets required on index streams.
5	Groundwater resources	At least eight participating	Interviews with NHS	Participating countries are	Development continuing under

	management capacity established in countries	countries with an established capability in groundwater monitoring and assessment.	Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database records	able to provide the basic requirements (access to and security of field sites, etc)	EU WaSSP as Samoa advances to GW utilisation, this module can be easily developed using HYCOS technologies and existing software subject to monitoring bores being constructed currently. In progress.
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	A modest WQ monitoring program is in operation addressing public health issues. Stream sediment is not currently measured; equipment is available.

NHS Placement – currently comes under the Ministry of Natural Resources and Environment

Logical Framework Of Major Project Components – Country By Country - Solomon Islands

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Warranted in Solomon's, installed equipment is upgradeable when/if required and subject to suitable and reliable communications. Needs improvement of basic flood measurements and datasets to progress further. Difficulty in sustaining remote equipment and in getting flood measurements undertaken, high vandalism risks.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	HYCOS sites (2) plus 2 more for installation will largely complete the network. This includes 6 recording raingauges. Operational practise is relatively poor with a limited field program and QA/QC procedures being undertaken. Implementation completion and consolidation activities and data analysis highly essential. Fundamental to develop robust datasets here to allow progression of other the project components.
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Solomon's has operated TIDEDA data base software for 25 years and has only modest capacity in this. Most hydrological data processed and backed up. More detailed training required in analysis and QA/QC processes and data presentation. Quality and quantity of data very poor. Greater commitment to data rescue required.
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Solomon's has very little good data with many gaps, it is unusable for analysis of low flow periods. Staff lack the analysis skills to undertake this work, forecasting seen as a NMS function. Continued development of low flow datasets required on

					index streams is highly essential.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Not yet developed. Potential for irrigation development of GW on Guadalcanal Plains, this module can be easily developed using HYCOS technologies and existing software subject to available monitoring bores being relocated.
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	WQ monitoring not undertaken. Stream sediment is not currently measured; equipment is available, laboratory facilities are not available for analysis.

NHS Placement – currently comes under the Ministry of Natural Resources, Department of Geology, Mines and Water Resources, structure is stable and has been in place since the 1980's

Logical Framework Of Major Project Components – Country By Country - Tonga

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not applicable – no surface water in Tonga.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Not applicable – no surface water in Tonga
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Tonga groundwater data at a National level is currently stored in an excel spreadsheets which has been provided to HYCOS for archival in the regional TIDEDA database. Groundwater data is being quality assured by MLSNRE and is to be archived
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Tonga Meteorological Service KMS is undertaking rainfall analysis using SCOPIC application which has rainfall prediction capability based on statistical methods.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National Groundwater Database	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Groundwater monitoring is in place and loggers have been deployed to key bores. Data archived into TIDEDA

			records		
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	HYCOS has provided MOH with quantitative IDEXX bacteriological assessment equipment. Water quality monitoring program commenced in 2009.

Logical Framework Of Major Project Components – Country By Country - Tuvalu

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not applicable – no surface water in Tuvalu
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Not applicable – no surface water in Tuvalu
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Tuvalu relies almost exclusively on rainwater harvesting. A geographic Information system GIS has been established in PWD to identify where the water supplies are located and their condition. Water quality information will be linked to the GIS as well to assist in water quality
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Tuvalu Meteorological Service is producing monthly summaries on the rainfall outlook. Additional support offered to TMS to produce drought preparedness information for community, expectation of assistance take up in May 2010
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual agency reports. National	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Groundwater monitoring currently not undertaken. Groundwater resources underlying Funafuti are brackish and in the main mostly unsuitable as a potable water source.

			Groundwater Database records		
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	HYCOS has provided MOH with quantitative IDEXX bacteriological assessment equipment. Water quality monitoring program commenced in 2008. Data stored at MoH, and provided to Tuvalu PWD

Logical Framework Of Major Project Components – Country By Country - Vanuatu

Task	Intervention logic	Objectively verifiable indicators of achievement/means	Sources and means of verification	Assumptions	Progress & Comments
1	Flood forecasting capacity developed in appropriate participating countries	At least six catchments for which a flood forecasting system is operational. Percentage of flood events for which a useful warning is provided.	Statistics provided by NHSs and presented in annual Project reports. Reports from NDMO and Met Services	Participating countries are able to identify catchments for which flood warning is warranted Participating countries are able to make available the basic requirements (radio communication channels, reliable power supplies etc) for the systems	Not currently warranted in Vanuatu, equipment when installed is upgradeable when/if required and subject to suitable and reliable communications. Needs improvement of basic flood measurements and datasets to progress further. Difficulty in getting flood measurements undertaken.
2	Water resources management capacity established in countries. ***(Water Resources Monitoring and Assessment in Major Rivers)***	At least six functioning near real time hydrological observing stations. Percentage of the total possible hydrological record that is securely archived and accessible	Statistics provided by NHSs and presented in annual Project reports.	Participating countries are able to identify catchments for which water resources assessment is warranted. Participating countries are able to make available the basic requirements (security, access, maintenance capabilities etc) for the system.	Implemented largely complete, limited field program undertaken and poor QA/QC procedures. Consolidation activities and data analysis essential. Fundamental to develop robust datasets here to progress the other project components. Concerns over NHS placement & commitment
3	Appropriately designed National Water Resources databases operational in participating countries and applied to catchment management	All participating countries (14) with a secure national database in which the data meet agreed quality standards. All participating countries (14) with NHSs able unaided to maintain national databases and generate information products	National Water Resources Database records. Monthly Data Reports	NHS directors are able to make available staff for training. Trained staffs are retained or can be replaced by the NHSs. Sustainability of computer and related equipment.	Vanuatu has operated TIDEDA data base software for 10 years and has limited capacity in use of this. Most hydrological data processed and backed up. More detailed training required in analysis and QA/QC processes and data presentation. Data rescue part undertaken, limited and poor quality data available
4	Appropriate and sustainable drought forecasting capability in countries	Availability of a Procedures Manual for drought forecasting to NHSs. Number of countries with an established national capability in drought forecasting	Procedures Manual. Interviews with NHS Directors and directors of national disaster management agencies and meteorological agencies.	Participating country governments wish to proceed to establish a national drought forecasting capability.	Vanuatu has limited data with many gaps; it is largely unusable for analysis of low flow periods. Staff lack the analysis skills to undertake this work, forecasting seen as a NMS function. Continued development of low flow datasets required on index streams.
5	Groundwater resources management capacity established in countries	At least eight participating countries with an established capability in groundwater monitoring and assessment.	Interviews with NHS Directors and directors of national groundwater assessment/development agencies. Annual	Participating countries are able to provide the basic requirements (access to and security of field sites, etc)	Not yet developed, this module can be easily developed using HYCOS technologies and existing software subject to available monitoring bores being

			agency reports. National Groundwater Database records		identified/constructed. GW study pending through an independent consultant
6	Water quality monitoring and resources protection capacity established including persistent chemical pollutants	All participating countries (14) with an established capability in water quality and chemistry monitoring and assessment.	Interviews with NHS Directors and expected users. National Water Quality Database records	Participating countries are able to provide the basic requirements (access to and security of field sites, etc). Participating countries have effective institutional arrangements and resources for water quality monitoring	WSP has funded WQ equipment and training and WQ database. A basic WQ monitoring program is in operation addressing public health issues. Stream sediment is not currently measured; equipment is available, laboratory not complete for analysis.

NHS Placement – currently comes under the Department of Geology, Mines and Water Resources

February 2010

ANNEX 3

STATEMENT OF PROJECT AND RELATED EXPENDITURE (A, B, C, D & E)

3A

PACIFIC ISLANDS APPLIED GEOSCIENCE COMMISSION (SOPAC)
PACIFIC HYCOS
PROGRESS REPORT FOR 6 MONTHS ENDING 30 DECEMBER 2009

		ACTUAL EURO		ACTUAL FJD
1.0.0	**Human Resources**			
1.0	**Salaries (Local Staff)**			
1.1.1	Technical Climate information officer (Linda)	5,379.19		15,582.83
1.1.2	Hydrologist Training Officer (Komal)	5,457.80		15,810.55
1.1.3	Water & Climate officer (Tuka)	(21.26)		(61.58)
1.1.4	Administrative / Support Staff			
1.2.0	**Salaries (Expatriate Staff)**			
1.2.1	Project Cordinator (Llyod)	44,345.04		28,461.89
1.2.2	Project Advisor (Peter)	38,017.15		10,130.79
1.2.3	Hydrological database Specialist (Edwin)	19,944.18		57,775.73
	Subtotal Human Resources	**113,122.11**		**327,700.21**
2.0.0	**Consultancies**			
2.1.0	Hydrological Specialists	127,742.22		70,052.79
2.2.0	Project Supervisor	-		-
	Subtotal Consultancies	**127,742.22**		**370,052.79**
3.0.0	**Travel**			
3.1.0	Airfares -Sopac Staff	8,183.95		23,707.86
3.2.0	Airfares Others-Seminars/Conference	519.85		1,505.95
3.3.0	Perdiems-Sopac Staff	11,429.73		33,110.45
3.4.0	Perdiems Others -Seminar/conference participants	285.83		828.00
3.5.0	Local transportation	512.37		1,484.27
	Subtotal Travel	**20,931.73**		**60,636.53**
4.0.0	**Office equipment, vehicles and supplies**			
4.1.0	Purchase or rent of Vehicles	-		-
4.2.0	Furniture, computer equipment	883.57		2,559.59
4.3.0	Spare parts/Equipment for machines/tools	-		-
	Subtotal Office equipment,Vehicle amd supplies	**883.57**		**2,559.59**
5.0.0	**In-country Monitoring Works**			
5.1.0	Other (In-country monitoring works)	93,856.13		271,889.15
	Subtotal In-country Monitoring Works	**93,856.13**		**271,889.15**
6.0.0	**Local office/Actions costs**			
6.1.0	Vehicles costs	-		
6.2.0	Office rent	42.73		123.79
6.3.0	Consumables-Office Supplies	119.29		345.58
6.4.0	Other services-(tel/fax,electricity/heating,maintenance	853.18		2,471.55
	Subtotal Local Office/Actions Costs	**1,015.21**		**2,940.92**
7.0.0	**Other Costs,services**			
7.1.0	Publications	97.00		280.99
7.2.0	Studies.research	-		-
7.3.0	Auditing costs	1,844.66		5,343.75

7.4.0	Evaluation costs	-		-
7.5.0	Translation ,Interpreters	-		
7.6.0	Financial services (Bank guarantee costs etc.)	198.91		576.23
7.7.0	Costs of conferences/Seminars	-		-
7.8.0	Visibility actions	1,480.02		4,287.43
	Subtotal Other costs,services	**3,620.60**		**10,488.40**
8.0.0	**Other**			
	Subtotal Other			
9.0.0	**Subtotal Direct costs of the action (1-7)**	**361,171.57**		**1,046,267.59**
10.0.0	**Administrative costs (5% total direct costs of the action)**	21,710.84		62,893.51
11.0.0	**Subcontracting related to construction activities**			
11.1.0	**Works**	-		-
11.2.0	**Supplies**	-		-
11.3.0	**Services**	-		-
12.0.0	**Total 9+10+11**	**382,882.41**		**1,109,161.10**
13.0.0	**Contingent (max 5% of 10)**	-		-
14.0.0	**Total Eligible costs of the Action (12+13)**	**382,882.41**		**1,109,161.10**
	Less-Funds Received from EU	732,763.93		2,122,722.86
	Other receipts	2,452.77		7,105.35
	Total Receipts	735,216.70		2,129,828.21
	Opening Balance July 2009	(77,346.78)		(179,126.39)
	Project Closing Balance	**274,987.51**		**841,540.72**

3B

STATEMENT OF INCOME AND EXPENDITURE FOR PERIOD July 2006 to Dec 2009

		ACTUAL EURO	ACTUAL FJD
1.0.0	**Human Resources**		
1.1.0	**Salaries (Local Staff)**		
1.1.1	Technical Climate information officer	42,258.48	100,991.10
1.1.2	Hydrologist Training Officer	44,408.38	106,015.69
1.1.3	Water & Climate officer	7,398.01	17,120.61
1.1.4	Administrative / Support Staff		
1.2.0	**Salaries (Expatriate Staff)**		
1.2.1	Project Cordinator (Llyod)	217,185.64	528,741.19
1.2.2	Project Advisor (Peter)	231,341.27	557,847.60
1.2.3	Hydrological database Specialist (Edwin)	68,644.73	170,560.69
	Subtotal Human Resources	**611,236.52**	**1,481,276.88**
2.0.0	**Consultancies**		
2.1.0	Hydrological Specialists	308,497.04	788,660.53
2.2.0	Project Supervisor		
	Subtotal Consultancies	**308,497.04**	**788,660.53**
3.0.0	**Travel**		
3.1.0	Airfares -Sopac Staff	85,605.78	203,008.08
3.2.0	Airfares Others-Seminars/Conference	55,575.85	129,009.43
3.3.0	Perdiems-Sopac Staff	102,101.23	243,095.40
3.4.0	Perdiems Others -Seminar/conference participants	50,240.91	116,518.32
3.5.0	Local transportation	5,870.71	13,893.59
	Subtotal Travel	**299,394.49**	**705,524.82**
4.0.0	**Office equipment, vehicles and supplies**		
4.1.0	Purchase or rent of Vehicles	38.86	90.00
4.2.0	Furniture, computer equipment	29,451.16	68,718.90
4.3.0	Spare parts/Equipment for machines/tools	16,186.03	37,485.02
	Subtotal Office equipment,Vehicle amd supplies	**45,676.05**	**106,293.92**
5.0.0	**In-country Monitoring Works**		
5.1.0	Other (In-country monitoring works)	68,644.73	1,718,772.17
	Subtotal In-country Monitoring Works	**718,620.22**	**1,718,772.17**
6.0.0	**Local office/Actions costs**		
6.1.0	Vehicles costs		
6.2.0	Office rent	153.68	380.73
6.3.0	Consumables-Office Supplies	3,489.07	8,149.60
6.4.0	Other services-(tel/fax,electricity/heating,maintenance	3,851.46	9,415.23
	Subtotal Local Office/Actions Costs	**7,494.21**	**17,945.56**
7.0.0	**Other Costs,services**		
7.1.0	Publications	1,043.33	2,472.58
7.2.0	Studies.research	411.28	952.48
7.3.0	Auditing costs	5,728.43	14,338.12
7.4.0	Evaluation costs	183.43	424.80
7.5.0	Translation ,Interpreters		

7.6.0	Financial services (Bank guarantee costs etc.)	1,583.50	3,782.78
7.7.0	Costs of conferences/Seminars	5,559.77	12,875.80
7.8.0	Visibility actions	11,008.39	26,354.06
	Subtotal Other costs,services	**25,518.14**	**61,200.62**
8.0.0	**Other**		
9.0.0	**Subtotal Direct costs of the action (1-6)**	**2,016,436.67**	**4,879,674.50**
10.0.0	Administrative costs (5% total direct costs of the action)	128,950.17	311,247.68
12.0.0	**Total 9+10+11**	**2,145,386.84**	**5,190,922.18**
13.0.0	**Contingent (max 5% of 10)**		
14.0.0	**Total Eligible costs of the Action (12+13)**	**2,145,386.84**	**5,190,922.18**
	Less-Funds Received from EU	**2,403,176.31**	**5,991,209.14**
	Other receipts	**17,198.05**	**41,253.76**
	Total Receipts	**2,420,374.36**	**6,032,462.90**
	Project Closing Balance	**274,987.52**	**841,540.72**

3C

EUROPEAN UNION

SOPAC

PACIFIC ISLANDS APPLIED GEOSCIENCE COMMISSION

PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM

AUDIT REPORT

30 JUNE 2009

Contents

Independent audit report 1-5

Balance sheet 6

Notes to the financial statements 7-8

Revenue and expenditure statement 9-10

Variance report 11-14

PACIFIC HYDROLOGICAL CYCLE SYSTEM

Independent Audit Report

30 JUNE 2009

ERNST & YOUNG

Quality In Everything We Do

Table of Contents

1.	**Audit plan**	**3**
	1.1 Pacific Hydrological Cycle Observing System	3
	1.2 Audit planning	3
	1.3 Audit team	4
2.	**Profile of SOPAC/Pacific HYCOS**	**4**
3.	**Audit Methodology**	**4**
4.	**Management Controls**	**4**
	4.1 Scope	4
	4.2 Findings	4
5.	**Financial Controls**	**5**
	5.1 Scope	5
	5.2 Findings	5
6.	**Cases on Non-Compliance with Contract Clauses**	**7**
7.	**Audit Opinion on Management Controls**	**7**
8.	**Audit Opinion on Financial Controls**	**7**

INDEPENDENT AUDIT REPORT

To the members of Pacific Hydrological Cycle Observing System

1. Audit plan

1.1 Pacific Hydrological Cycle Observing System

The Pacific Hydrological Cycle Observing System (Pacific HYCOS) project was developed by World Metrological Organisation (WMO) in collaboration with the Pacific Islands Applied Geoscience Commission (SOPAC) and in consultation with countries and territories in response to the hydrological needs of the region. The period for the project is 36 months from June 2006 to June 2009. It has been extended for another year until 2010. The Pacific HYCOS project was executed under SOPAC's Community Lifelines Programme and is funded by the European Union (EU). The goal of the project is to enable more informed decision-making on integrated catchment management and planning, leading to progress towards Small Island Developing States (SIDS) sustainable development and the Millennium Development Goals, through the sustainable management of their freshwater resources particularly during increasingly climatic extremes. The project is carried out in 14 Pacific Island Countries (PIC's) including the Cook Islands, Federated States of Micronesia, Fiji Islands, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

1.2 Audit planning

Reported project-related budgetary expenditure for 2009: EUR 1,128,123

EC amount paid: There was no funding received for this financial year. Subsequent to year end, the project received EUR 732,778.20.

Organisation under review: Pacific HYCOS

Dates of site visit: 19th September - 13th October 2008.

Contact person: Lucia Kafoa (Accountant) and Mohammed Irfaq (Project Officer).

Project Staff: Marc Overmars (Head of Water Department), Llyod Smith (Regional Project Coordinator), Peter Sinclair (Regional Project Advisor), Edwin Liava (GIS/Database Specialist), David Turner (Hydrologist), Tiy Chung (Communications Advisor), Komal Raman (Project Officer), Linda Yuen (Project Officer), and Avitesh Ram (Technical Officer).

Contractual basis for visit: Independent financial audits of the work programmes undertaken for the period.

1.3 Audit team

Engagement and review partner: Steven Pickering

Manager: Ashishma Lal

Auditor: Xueru Zhang, Zeenal Samut

2. Profile of SOPAC/Pacific HYCOS

As part of the audit, we confirmed our understanding of the project and the implementing agency's internal control structure and made an assessment of internal controls. In our opinion, SOPAC maintains reliable accounting and internal control systems as the implementing agency.

3. Audit Methodology

Our audit was performed in accordance with International Standards on Auditing.
Our procedures included examination on a test basis, of evidence supporting the amounts and other disclosures in the Financial Statements and the evaluation of accounting policies. Examples of audit procedures undertaken were:

a) Inspection of original support documentation;
b) Review of bank account reconciliations;
c) Confirming that financial income earned with project funds has been recognised in the project's financial reports;
d) Confirmation of the bank account; and
e) Evaluation of accounting systems in place to monitor the use of funds and assigned expenditure against budgeted expenditure.

4. Management Controls

4.1 Scope

The scope of the audit on the Pacific HYCOS project included the evaluation of the internal control system in place for the management of the project in order to ensure that:

a) it was in agreement with the Financing Agreement;
b) there was orderly and efficient conduct of the project;
c) it allows for the reasonable prevention and detection of irregularities or fraud; and
d) there was preparation and maintenance of adequate records and accounts.

4.2 Findings

There are no material issues to report.

5. Financial Controls

5.1 Scope

The scope of the audit on the Pacific HYCOS project included the evaluation of the financial controls in place for the project, in order to ensure that:

a) expenditure related to agreed project budget items specified in the Financing Agreement;

b) expenditure was adequately supported with original supporting documents and has been properly accounted for;

c) expenditure was incurred during the audit period i.e. the financial year from 01 July 2008 to 30 June 2009;

d) expenditure charged against the project was duly authorised in accordance with contractual basis of the project;

e) income earned in relation to project funds was disclosed in the financial reports in the execution of the project;

f) any use of income earned in relation to project funds was in agreement with the contractual basis of the Financing Agreement; and

g) financial contributions to or emanating from, the project has been provided for in the form, periodicity and nature foreseen by the contractual basis of the project.

5.2 Findings

Our specific findings are as follows:

1. **Project funding: Nil**

   Funding was in accordance with Article 4 and 15 of the Contribution Agreement. There was no funding received in this financial year. Subsequent to the financial year, the project received its third tranche of funding of EUR 732,778.20.

2. **Reported project-related budgetary expenditures of EUR 1,128,123.**

   Project related budgetary expenditures were properly documented and authorized with appropriate supporting documents maintained in a secure place. Expenditures incurred were within budgetary lines except for human resources, travel, in-country monitoring works, other costs/services and administrative costs. These have exceeded the budget by more than 10% for the year.

   Human resources and travel costs exceeded budget by 20% (EUR 39,850 and EUR 23,189), in-country monitoring works by 135% (EUR 338,691), other costs/services by 16% (EUR 1,479) and administrative costs was overspent by 39% (EUR 13,841) compared to budget.

Costs have been incurred for some expenditure where there was no budget. These costs were furniture and computer equipment (EUR 7,097), office rent (EUR 69), other services -telephone/fax (EUR 1,563), financial services (EUR 867), cost of conferences/seminars (EUR 5,021) and visibility actions (EUR 1,273).

3. The project has acquired assets of EUR 564,074.40 from 01 July 2008 to 30 June 2009. For the purposes of this project, these acquisitions were expensed. From total assets purchased, EUR 561,621.10 of assets were purchased for member countries while EUR 2,453.31 of assets are with the SOPAC Secretariat.

4. Liabilities for EUR 310,192 have been disclosed and/or entered into in accordance with their legal/contractual basis.

   Liabilities that exist on balance date have been properly disclosed in the notes to the financial statements and relate to the accrual of audit fees, amounts owing for air fares, amounts owing to the SOPAC Secretariat for the reimbursement of expenses for the project, accruals for annual leave and commitments made during the financial year which have not been paid.

5. Interest earned related to project funds EUR 11,635

As a result of these financial findings and in compliance with the legal/contractual basis the Pacific HYCOS project has a negative funds balance of EUR 337,396 for the year ended 30 June 2009.

6. Cases on Non-Compliance with Contract Clauses

To the best of our understanding, project activities carried out during the year are in compliance with legal/contractual basis of the project.

7. Audit Opinion on Management Controls

Ernst and Young has carried out an audit of the systems governing the operation of the project. In our opinion, the procedures and internal set up by SOPAC for the Pacific HYCOS project;

a) provide for adequate financial management of the Pacific HYCOS project;
b) are operating satisfactorily;
c) are in agreement with the legal/contractual basis of the Financing Agreement and Grant Agreement; and
d) provide for reasonable prevention and detection of errors, irregularities and fraud.

8. Audit Opinion on Financial Controls

Ernst and Young has carried out an audit of the funds used in the implementation of the "Pacific Hydrological Cycle Observing System" project for the year ended 30 June 2009. In our opinion, project funds covered by this audit have been used in accordance with its legal/contractual basis.

Ernst and Young

Ernst & Young
Chartered Accountants

Suva, Fiji
20 October 2009

ERNST & YOUNG
Quality In Everything We Do

PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM

BALANCE SHEET

AS AT 30 JUNE 2009

	Notes	2009 EURO	2009 FJD	2008 EURO	2008 FJD
FUNDS BALANCE					
Balance at period-end		(337,396)	(781,372)	(342,794)	(741,496)
TOTAL FUNDS BALANCE		**(337,396)**	**(781,372)**	**(342,794)**	**(741,496)**
Represented by:					
Current Assets					
Cash at bank	2	(31,007)	(71,808)	(182,328)	(394,393)
Prepayments		4,211	9,753	2,146	4,642
Trade Receivables	3	(408)	(945)	1,843	3,987
Total current assets		(27,204)	(63,000)	(178,339)	(385,764)
Current Liabilities					
Accruals	4	253,726	587,600	133,941	289,728
Trade creditors	5	56,466	130,772	30,514	66,004
Total current liabilities		310,192	718,372	164,455	355,732
NET LIABILITIES		**(337,396)**	**(781,372)**	**(342,794)**	**(741,496)**

The accompanying notes form an integral part of this Balance Sheet.

The above gives a true and fair view of the position of the Project for the year ended 30 June 2009.

Mohinish Kumar
Manager Corporate Services

for Lloyd Smith
Regional Project Coordinator

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Significant accounting policies adopted by the Project is set out in this note. The financial statements have been prepared in accordance with generally accepted accounting principles in Fiji.

a) Cash and cash equivalents

Cash and cash equivalents consist of balances with the bank.

b) Currency used in financial statement

The amounts reflected in the financial statements are stated in the Euro and Fijian currency. The exchange rate used to convert FJD to EURO is 0.4318 (2008: 0.4623).

c) Foreign currency

Foreign currency transactions are translated to Fijian dollars at rates of exchange ruling at the date of the transactions. Amounts receivable and payable in foreign currencies are converted to Fiji dollars at the rates of exchange ruling at the balance sheet date.

d) Income tax

Under section 17(24) of the Fiji Income Tax Act, the Project is exempt from income tax.

e) Receivables

Trade receivables are recognised at original invoice amount.

f) Revenue recognition

Revenue is brought to account when the cash is received.

g) Trade and other payables

Liabilities for trade creditors and other amounts are carried at cost which is the fair value of the consideration to be paid in the future for goods and services received whether or not billed to the Project.

h) Comparative figures

Where necessary, the comparative figures have been adjusted to conform with changes in presentation in the current year.

2. CASH AT BANK	2009 EURO	2009 FJD	2008 EURO	2008 FJD
Colonial operating account	(31,007)	(71,808)	(182,328)	(394,393)

Subsquent to year end, the project received EUR 732,778.

3. TRADE RECEIVABLES	EURO	FJD	EURO	FJD
Sundry staff advance	(408)	(945)	1,194	2,584
Sundry receivables	-	-	649	1,403
	(408)	(945)	1,843	3,987

4. ACCRUALS	EURO	FJD	EURO	FJD
Leave accruals	18,122	41,968	7,796	16,864
Accruals	235,604	545,632	126,145	272,864
	253,726	587,600	133,941	289,728

5. TRADE CREDITORS	EURO	FJD	EURO	FJD
Ajax Spurway Fastners Ltd	18	44	-	-
Air New Zealand	4,756	11,014	2,458	5,314
Air Pacific	4,962	11,491	-	-
ANZ Card Services	63	146	-	-
AON Risk Services (Fiji) Ltd	538	1,245		
Bondwell Computers (Fiji) Ltd	215	498	2,472	5,347
EMS	721	1,670	-	-
Eden & Associates Ltd	2,500	5,790	-	-
Fiji Care Insurance Ltd	294	681	1,064	2,301
Fiji National Providend Fund	65	151	(266)	(574)
Fiji Revenue and Customs Authority	115	266	-	-
Jedi's Stationery	636	1,473	495	1,071
Office Products	220	510	-	-
Post Fiji Ltd	44	101	-	-
Pan Pacific Tours	116	269	-	-
Qantas Airways Limited	7,973	18,465	4,202	9,090
Quality Print Limited	138	320	-	-
RC Manubhai & Co Ltd	-	-	173	375
SOPAC Secretariat	9,844	22,798	8,164	17,660
Star Printery	656	1,520	647	1,400
Sundry creditors	6,916	16,017	10,771	23,299
Vinod Patel & Company Ltd	84	194	334	721
Williams & Goslings Ltd	920	2,131	-	-
Westpac Banking Corporation	14,672	33,978	-	-
	56,466	130,772	30,514	66,004

REVENUE AND EXPENDITURE STATEMENT
FOR THE YEAR ENDED 30 JUNE 2009

		2009 EURO	2009 FJD	2008 EURO	2008 FJD
REVENUE					
Opening balance		(320,178)	(741,496)	435,386	941,783
EU funds received		1,099,628	2,546,615	-	-
Other		11,277	26,116	858	1,856
Total revenue		790,727	1,831,235	436,244	943,639
EXPENDITURE					
1.0.0	**Human Resources**				
1.1.0	**Salaries (Local Staff)**				
1.1.1	Technical climate information officer	12,552	29,070	14,988	32,421
1.1.2	Hydrologist training officer	12,652	29,300	14,388	31,122
1.1.3	Water & climate officer	5,068	11,737	2,517	5,445
1.2.0	**Salaries (Expatriate Staff)**				
1.2.1	Project coordinator	83,448	193,257	70,707	152,946
1.2.2	Project advisor	78,579	181,980	88,037	190,432
1.2.3	Hydrological database specialist	43,105	99,827	7,807	16,888
	Subtotal Human Resources	235,404	545,171	198,444	429,254
2.0.0	**Consultancies**				
2.1.0	Hydrological specialists	96,867	224,334	158,368	342,565
2.2.0	Project Supervisor	-	-	-	-
	Subtotal Consultancies	96,867	224,334	158,368	342,565
3.0.0	**Travel**				
3.1.0	Airfares - SOPAC staff	35,039	81,146	31,649	68,460
3.2.0	Airfares others - seminar/conference	23,478	54,373	15,128	32,723
3.3.0	Perdiems SOPAC staff	48,476	112,265	36,611	79,194
3.4.0	Perdiems others - seminar/conference participants	28,022	64,896	8,851	19,145
3.5.0	Local transportation	1,422	3,294	4,387	9,489
	Subtotal travel	136,437	315,974	96,626	209,011
4.0.0	**Office equipment, vehicles and supplies**				
4.1.0	Purchase or rent of vehicles	-	-	-	-
4.2.0	Furniture and computer equipment	7,097	16,435	13,249	28,658
4.3.0	Spare parts/equipment for machines/tools	-	-	1,293	2,797
	Subtotal Office equipment, vehicles and supplies	7,097	16,435	14,542	31,455
5.0.0	**In-country monitoring works**				
5.1.0	Other (In-country monitoring works)	589,399	1,364,981	241,406	522,185
	Subtotal office equipment, vehicle and supplies	589,399	1,364,981	241,406	522,185

REVENUE AND EXPENDITURE STATEMENT
FOR THE YEAR ENDED 30 JUNE 2009

		2009 EURO	2009 FJD	2008 EURO	2008 FJD
6.0.0	**Local office/action costs**				
6.1.0	Vehicles costs	-	-	-	-
6.2.0	Office rent	69	160	-	-
6.3.0	Consumables - office supplies	1,078	2,496	2,092	4,525
6.4.0	Other services - tel/fax, electricity/heating	1,563	3,620	1,442	3,118
	Subtotal local office/action costs	2,710	6,276	3,534	7,643
7.0.0	**Other costs/services**				
7.1.0	Publications	870	2,015	-	-
7.2.0	Studies research	411	952	-	-
7.3.0	Auditing costs	2,349	5,441	2,213	4,784
7.4.0	Evaluation costs	-	-	173	375
7.5.0	Translation, interpreters	-	-	-	-
7.6.0	Financial services	867	2,007	540	1,169
7.7.0	Cost of conferences/seminars	5,021	11,627	577	1,249
7.8.0	Visibility actions	1,273	2,948	6,793	14,695
				-	-
	Subtotal other costs/services	10,791	24,990	10,296	22,272
8.0.0	Subtotal direct costs of the action	1,078,705	2,498,161	723,216	1,564,385
9.0.0	Administrative costs	49,418	114,446	55,822	120,750
10.0.0	Total eligible costs of the action	1,128,123	2,612,607	779,038	1,685,135
Total expenditure		1,128,123	2,612,607	779,038	1,685,135
Net deficit		(337,396)	(781,372)	(342,794)	(741,496)

PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM
VARIANCE REPORT
FOR THE YEAR ENDED 30 JUNE 2009

		EU Budget EUR	Actual EUR	Variance EUR
EXPENDITURE				
1.0.0	**Human Resources**			
1.1.0	**Salaries (Local Staff)**			
1.1.1	Technical climate information officer	12,894	12,552	342
1.1.2	Hydrologist training officer	12,894	12,652	242
1.1.3	Water and climate officer	12,894	5,068	7,826
1.1.4	Administrative/support staff	8,596	-	8,596
1.2.0	**Salaries (Expatriate Staff)**			
1.2.1	Project coordinator	53,723	83,448	(29,725)
1.2.2	Project advisor	34,383	78,579	(44,196)
1.2.3	Hydrological database specialist	60,170	43,105	17,065
	Subtotal human resources	195,554	235,404	(39,850)
2.0.0	**Consultancies**			
2.1.0	Hydrological specialists	137,531	96,867	40,664
2.2.0	Project Supervisor	21,489	-	21,489
	Subtotal Consultancies	159,020	96,867	62,153
3.0.0	**Travel**			
3.1.0	Airfares - SOPAC staff	53,723	35,039	18,684
3.2.0	Airfares others - seminar/conference	-	23,478	(23,478)
3.3.0	Perdiems SOPAC staff	34,383	48,476	(14,093)
3.4.0	Perdiems others - seminar/conference participants	25,142	28,022	(2,880)
3.5.0	Local transportation	-	1,422	(1,422)
	Subtotal travel	113,248	136,437	(23,189)
4.0.0	**Office equipment, vehicles and supplies**			
4.1.0	Purchase or rent of vehicles	-	-	-
4.2.0	Furniture and computer equipment	-	7,097	(7,097)
4.3.0	Spare parts/equipment for machines/tools	10,745	-	10,745
	Subtotal office equipment, vehicle and supplies	10,745	7,097	3,648
5.0.0	**In-country monitoring works**			
5.1.0	Other (In-country monitoring works)	250,708	589,399	(338,691)
	Subtotal office equipment, vehicle and supplies	250,708	589,399	(338,691)

PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM
VARIANCE REPORT
FOR THE YEAR ENDED 30 JUNE 2009

		EU Budget EUR	Actual EUR	Variance EUR
6.0.0	**Local office/action costs**			
6.1.0	Vehicles costs	-	-	-
6.2.0	Office rent	-	69	(69)
6.3.0	Consumables - office supplies	3,438	1,078	2,360
6.4.0	Other services - tel/fax, electricity/heating	-	1,563	(1,563)
	Subtotal local office/action costs	3,438	2,710	728
7.0.0	**Other costs/services**			
7.1.0	Publications	4,298	870	3,428
7.2.0	Studies research	-	411	(411)
7.3.0	Auditing costs	5,014	2,349	2,665
7.4.0	Evaluation costs	-	-	-
7.5.0	Translation, interpreters	-	-	-
7.6.0	Financial services	-	867	(867)
7.7.0	Cost of conferences/seminars	-	5,021	(5,021)
7.8.0	Visibility actions	-	1,273	(1,273)
	Subtotal other costs/services	9,312	10,791	(1,479)
8.0.0	Subtotal direct costs of the action	742,025	1,078,705	(336,680)
9.0.0	Administrative costs (5% of direct costs of the action)	35,577	49,418	(13,841)
10.0.0	Total	777,602	1,128,123	(350,521)
11.0.0	Contingent (5% of total costs of the action)	36,668	-	36,668
12.0.0	Total eligible costs of the action	814,270	1,128,123	(313,853)
Total expenditure		814,270	1,128,123	(313,853)

PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM
VARIANCE REPORT
FOR THE YEAR ENDED 30 JUNE 2009

		EU Budget FJD	Actual FJD	Variance FJD
EXPENDITURE				
1.0.0	**Human Resources**			
1.1.0	**Salaries (Local Staff)**			
1.1.1	Technical climate information officer	29,861	29,070	791
1.1.2	Hydrologist training officer	29,861	29,300	561
1.1.3	Water and climate officer	29,861	11,737	18,124
1.1.4	Administrative/support staff	19,907	-	19,907
1.2.0	**Salaries (Expatriate Staff)**			
1.2.1	Project coordinator	124,416	193,257	(68,841)
1.2.2	Project advisor	79,627	181,980	(102,353)
1.2.3	Hydrological database specialist	139,347	99,827	39,520
	Subtotal human resources	452,880	545,171	(92,291)
2.0.0	**Consultancies**			
2.1.0	Hydrological specialists	318,506	224,334	94,172
2.2.0	Project Supervisor	49,766	-	49,766
	Subtotal Consultancies	368,272	224,334	143,938
3.0.0	**Travel**			
3.1.0	Airfares - SOPAC staff	124,416	81,146	43,270
3.2.0	Airfares others - seminar/conference	-	54,373	(54,373)
3.3.0	Perdiems SOPAC staff	79,627	112,265	(32,638)
3.4.0	Perdiems others - seminar/conference participants	58,226	64,896	(6,670)
3.5.0	Local transportation	-	3,294	(3,294)
	Subtotal travel	262,269	315,974	(53,705)
4.0.0	**Office equipment, vehicles and supplies**			
4.1.0	Purchase or rent of vehicles	-	-	-
4.2.0	Furniture and computer equipment	-	16,435	(16,435)
4.3.0	Spare parts/equipment for machines/tools	24,884	-	24,884
	Subtotal office equipment, vehicle and supplies	24,884	16,435	8,449
5.0.0	**In-country monitoring works**			
5.1.0	Other (In-country monitoring works)	580,611	1,364,981	(784,370)
	Subtotal office equipment, vehicle and supplies	580,611	1,364,981	(784,370)

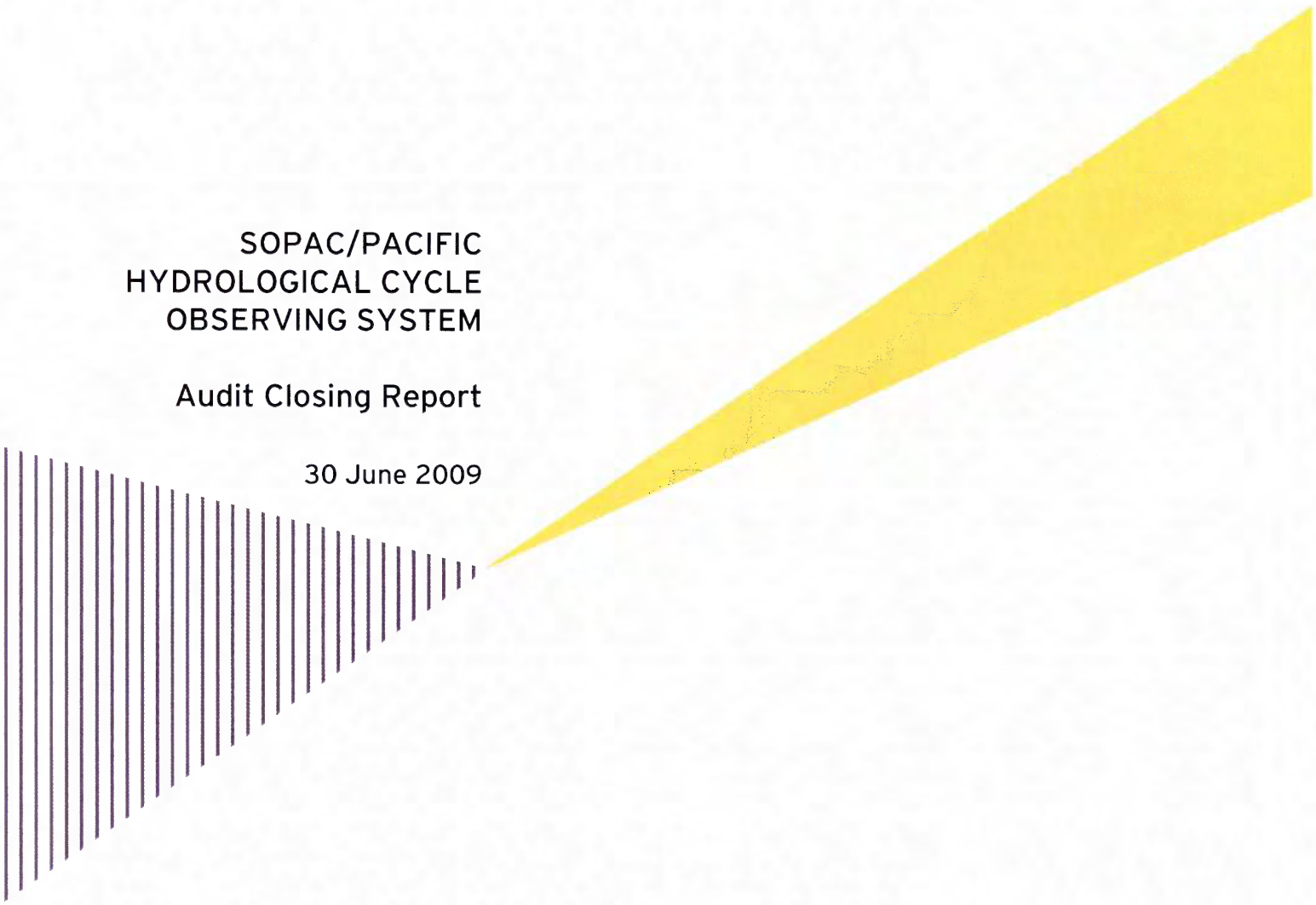
PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM
VARIANCE REPORT
FOR THE YEAR ENDED 30 JUNE 2009

		EU Budget FJD	Actual FJD	Variance FJD
6.0.0	**Local office/action costs**			
6.1.0	Vehicles costs	-	-	-
6.2.0	Office rent	-	160	(160)
6.3.0	Consumables - office supplies	7,962	2,496	5,466
6.4.0	Other services - tel/fax, electricity/heating	-	3,620	(3,620)
	Subtotal local office/action costs	7,962	6,276	1,686
7.0.0	**Other costs/services**			
7.1.0	Publications	9,954	2,015	7,939
7.2.0	Studies research	-	952	(952)
7.3.0	Auditing costs	11,612	5,441	6,171
7.4.0	Evaluation costs	-	-	-
7.5.0	Translation, interpreters	-	-	-
7.6.0	Financial services	-	2,007	(2,007)
7.7.0	Cost of conferences/seminars	-	11,627	(11,627)
7.8.0	Visibility actions	-	2,948	(2,948)
	Subtotal other costs/services	21,566	24,990	(3,424)
8.0.0	Subtotal direct costs of the action	1,718,444	2,498,161	(779,717)
9.0.0	Administrative costs (5% of direct costs of the action)	82,392	114,446	(32,054)
10.0.0	Total	1,800,836	2,612,607	(811,771)
11.0.0	Contingent (5% of total costs of the action)	84,919	-	84,919
12.0.0	Total eligible costs of the action	1,885,755	2,612,607	(726,852)
Total expenditure		1,885,755	2,612,607	(726,852)

SOPAC/PACIFIC HYDROLOGICAL CYCLE OBSERVING SYSTEM

Audit Closing Report

30 June 2009



Ernst & Young
Quality In Everything We Do

Table of Contents

1. **Executive Summary** 3

2. **Accounting Policies** 4

3. **Operating Result Review** 5

   3.1 Human Resource costs 6

   3.2 Consultancy costs 6

   3.3 Travel costs 6

   3.4 Office equipment, vehicles and supplies costs 6

   3.5 In-country monitoring works costs 6

   3.6 Local office/action costs 7

   3.7 Other costs/services 7

   3.8 Administration costs 7

4. **Significant Business, Accounting and Internal Control Matters** 8

   4.1 Exceeding the budget 8

1. Executive Summary

Audit Opinion

We have completed our audit of SOPAC/Pacific Hydrological Cycle Observing System (Pacific HYCOS) project for the year ended 30 June 2009. Our audit was performed in accordance with International Standards on Auditing.

In our unqualified opinion, the financial statements gives a true and fair view of the financial position as at 30 June 2009 and of their performance for the year ended on that date and are presented fairly in accordance with generally accepted accounting principles and the implementing agency's (SOPAC) policies.

Results of the Audit

During our audit, audit issues that came to our attention have been noted in Section 4 of this report. We recommend that members consider the issues and ensure:

- that there are no residual further considerations or matters of which you are aware that could impact upon these issues;
- that you concur with the particular resolution of the issue; and
- that there are no further significant issues that you are aware of that ought to be considered.

Internal Controls

Our audit provided us with the opportunity to consider areas of the business and in particular assess the internal control structure. We have assessed that the internal control structure is effective and there are no material weaknesses to report.

2. Accounting Policies

Our audit procedures included consideration of the accounting and reporting policies applied by the SOPAC/Pacific HYCOS project to ensure that they were consistently applied.

As a result of our audit, we report that the accounting and reporting policies have been consistently applied during the year ended 30 June 2009.

3. Operating Result Review

The Pacific Hydrological Cycle Observing System (Pacific HYCOS) project was developed by the World Metrological Organization (WMO) in collaboration with the Pacific Islands Applied Geoscience Commission (SOPAC) and in consultation with countries and territories in response to hydrological needs of the region. The period for the project is 36 months from June 2006 to June 2009. It has been extended for another year until 2010. The Pacific HYCOS project was executed under SOPAC's Community Lifelines Programme and is funded by the European Union. The goal of the project is to enable more informed decision-making on integrated catchment management and planning, leading to progress towards Small Island Developing States (SIDS) sustainable development and the Millennium Development Goals, through the sustainable management of their freshwater resources particularly during increasingly climatic extremes. The project is carried out in 14 Pacific Island Countries (PIC's) including the Cook Islands, Federated States of Micronesia, Fiji Islands, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

Comparisons between actual disbursements and amounts budgeted for disbursements record that EUR 313,853 was overspent for the period year 30 June 2009.

Differences between actual and budgeted expenditure as below:

EU BUDGET

Operating Results Review Budget Line Descriptions	BUDGET June 2009 EURO	ACTUAL June 2009 EURO	VARIANCE June 2009 EURO
1.0 Human Resources costs	195,554	235,404	(39,850)
2.0 Consultancy costs	159,020	96,867	62,153
3.0 Travel costs	113,248	136,437	(23,189)
4.0 Office equipment, vehicles and supplies	10,745	7,097	3,648
5.0 In-country monitoring works costs	250,708	589,399	(338,691)
6.0 Local office/action costs	3,438	2,710	728
7.0 Other costs/services	9,312	10,791	(1,479)
8.0 Administrative costs	35,577	49,418	(13,841)
9.0 Contingent	36,668	-	36,668
TOTAL ELIGIBLE COSTS OF THE ACTION	**814,270**	**1,128,123**	**(313,853)**

Major differences in actual versus budgeted spending were as follows:

3.1 Human Resource costs

Human resource costs relates to salaries for SOPAC staff attached to the Pacific HYCOS Project. This costs budget allocation was overspent by EUR 39,850 which is 20% of the budgeted amount. This was due to overspending on project coordinator and project advisor costs. The project advisor role was upgraded to reflect the additional responsibilities and included activities undertaken by hydrological specialists. Also the project coordinator undertook some activities that were originally identified for hydrological specialists. In addition the variance includes additional entitlements such as medical, FNPF, schooling, accommodation and home leave.

3.2 Consultancy costs

This cost code is for consultants employed for the project. The consultancies budget was under spent by EUR 62,153 for the year ended 30 June 2009. This was due to savings incurred under the project supervisor and hydrological specialists' budget category as some activities were undertaken by the project coordinator and project advisor.

3.3 Travel costs

The travel costs budget code relates to transportation (airfares, perdiems and local transportation) incurred for the project. The amount budgeted was EUR 113,248 however the project incurred expenditure of EUR 136,437 resulting in over spending by EUR 23,189 which is 20% of budget. Due to the delay in the commencement of the project, there was delay in implementation and expenditure in this budget category.

3.4 Office equipment, vehicles and supplies costs

This budget code relates to costs incurred for the procurement of computers, office furniture and other supplies. Under expenditure amounting to EUR 3,648 was incurred for this code during the year as office equipment was acquired earlier in the project period.

3.5 In-country monitoring works costs

Budgeted costs for in-country monitoring was EUR 250,708 while the actual cost incurred was EUR 589,399 over spending by EUR 338,691. The overspending was due to the delay in the project which resulted in the shifting in the timing of the actual expenditure. Under spending was noted in the prior year due to delay in project commencement. The project took the approach that expenditure in countries should be at a pace in which the countries are able to absorb. Delays in countries to undertake implementation resulted in delays to project expenditure.

3.6 Local office/action costs

Costs for this budget code included consumables (office supplies) and other expenses such as telephone, fax and postage. There was overspending of EUR 728 due to telephone expenses not originally budgeted.

3.7 Other costs/services

Overspending of EUR 1,479 was incurred due to expenses such as studies research costs, financial services, and the cost of conference/seminars and visibility actions which was not in initial budget estimates. Costs budgeted for were publications and auditing costs.

3.8 Administration costs

Indirect costs are 5% (max 7%) of total direct costs. Administrative costs were budgeted at EUR 35,577 but actual costs incurred was EUR 49,418 resulting in overspending amounting to EUR 13,841 which is 39% of the budget. Overspending occurred due to additional administrative costs as a portion of the project supervisor salary was undertaken by an in house staff.

4. Significant Business, Accounting and Internal Control Matters

4.1 Exceeding the budget

Observation

We noted that human resource, travel, in-country monitoring works, other costs/services and administrative costs have exceeded budget by more than 10%. As per the EU agreement, budget variances should not exceed by 10%.

Human resources and travel was overspent by 20% (EUR 39,850 and EUR 23,189), in-country monitoring works by 135% (EUR 338,691), other costs/services by 16% (EUR 1,479) and administrative costs was overspent by 39% (EUR 13,841) compared to budget.

Management Comment

Management notes the over expenditure in relation the Pacific HYCOS Project. The over spending is in response to the delay in commencement of the project by six months. Majority of the expenditure such as purchase and deployment of equipment and installations were done in this accounting period and will continue until the closure of the Project which has been extended until end of 2010.

During the initial years of the project, there was under spending due to delays in the Project gaining its momentum. This has now resulted in overspending in the project activities in the current period as majority of the Project work were loaded onto the later years of the Project life. This has lead to overspending in project activities such as in-country works, project travel and human resource costs.

The over expenditure of administrative budget is where support has been provided to the strategic and coordination role of the water sector to ensure integration of the project with other SOPAC, regional and country initiatives in water. The role has not been appropriately budgeted for in the initial project design.

3D

WATER QUALITY MANAGEMENT
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDING 31ST DECEMBER, 2009

	NZD			FJD		
	Budget	Year 4 Actual	Variance	Budget	Year 4 Actual	Variance
Opening Balance	-	53,313.06	(53,313.06)	-	58,065.74	(58,065.74)
Income						
NZAID	233,313.06	50,000.00	183,313.06		64,817.22	(64,817.22)
Total Income	233,313.06	103,313.07	129,999.99	-	122,882.96	(122,882.96)
Expenditure						
Programme Management	63,000.00	39,226.48	23,773.52	81,669.69	50,851.02	30,818.67
Travels and Missions	48,000.00	26,364.91	21,635.09	62,224.53	34,178.01	28,046.52
Equipment and Consumables	22,000.00	32,032.15	(10,032.15)	28,519.57	41,524.70	(13,005.13)
Water Sample Analysis	30,000.00	23,726.39	6,273.61	38,890.33	30,757.58	8,132.75
Consultancies	25,000.00	16,218.09	8,781.91	32,408.61	21,024.23	11,384.38
Training (Water Quality and Database)	30,000.00	16,078.54	13,921.46	38,890.33	20,843.32	18,047.01
Awareness Raising	8,000.00	8,377.63	(377.63)	10,370.75	10,860.30	(489.54)
Miscellaneous	7,313.06	1,142.00	6,171.06	9,480.24	1,480.43	7,999.81
Total Expenditure	233,313.06	163,166.20	70,146.86	302,454.06	211,519.57	90,934.49
Balance	-	(59,853.13)	59,853.13	(302,454.06)	(88,636.61)	(213,817.45)

Certified Correct:

Mohinish Kumar
Manager Corporate Services
26th January, 2009

3E

PACIFIC ISLANDS APPLIED GEOSCIENCE COMMISSION
INCOME AND EXPENDITURE REPORT FOR YEAR ENDING DECEMBER 2009
FOR RT 2006.013 / HISTORICAL DATA RESCUE

		ACTUAL FJD
700300	Opening Balance - 2008	(87,707.97)
	REVENUE	
100100	Program Admin Support Cost	-
100200	Member Country Contributions	-
100300	Fiji Government Grants	-
100400	Other Grants	-
100500	Interest on Investments	-
100600	Interest on Operating Account	-
100700	Exchange Gain & Loss	-
100800	Customs Refunds	-
100900	Transfer of Funds	(11,989.00)
101000	RXB Contributions	-
101100	XB Contributions	222,226.32
101200	Special Contributions	-
101300	Voluntary Contributions	-
101400	Miscellaneous Revenue	-
		-
	Total Revenue	**210,237.32**
	EXPENDITURE	
201010	Personnel Emoulments & related Cost	-
201020	Overtime and Relieving	-
201030	Job Training/Fellowships/Allowance	-
201035	Fellowships Allowance	-
201040	Appointment/Termination & Leave Costs	-
201050	Super Annuation	-
201060	Education Allowances	-
201070	Staff Insurance & Medical Cost	-
201080	Staff Insurance-In House Scheme	-
201090	Annual Leave-Gross	-
201100	Annual Leave-FNPF	-
202010	Airfares - Sopac Staff	-
202020	Airfares - Others	-
202030	DSA - SOPAC Staff	-
202040	DSA - Others	-
203010	Regional Workshop & Seminar	-
203020	In-country Workshop & Seminars	-
203030	Workshop Vehicle Support	-
203040	Workshop Supplies & Consumables	-
204010	Field Survey Area Expenses	-
204020	Analysis / Assays	-
204030	Survey Incidentals	-
204040	Field Work - General	-
204050	Data Storage Facilities	-
205010	Equipment Repairs & Maintenance	-
205020	Data Handling Equipment	-
205030	Image Acquisition	-
206010	Computer Accessories & Consumables	-
206020	Computer Software	-
206030	Computer Hardware	-
207010	Annual Session - Member Country Rep. Costs	-
207020	Annual Session - Other Costs	-
207030	Chairman & Sub-committee Costs	-
207040	Country Profile costs	-
207050	Support Costs	-
207060	Consultancy Fees	110,804.86

208010	Audit Fees	-
208020	Office Rent	-
208030	Printing and Reporting	-
208040	Subscriptions / Periodicals	-
208050	Stationary & Office Supplies	7.20
208060	Postage & Freight	-
208070	Taxi & Mileage Claims	-
208080	Advertising Costs	-
208090	Official Entertainment	-
208100	Incidental Expenses	-
208110	Office Furniture & Fittings	-
208120	Office Equipment Maintenance & Support	-
208121	Purchase of Office Equipment	-
208130	Operation/R & M - Motor Vehicle	-
208131	Purchase of Motor Vehicle	-
208140	General Office Sundries	60.00
208150	Special Expenditure	-
209010	Building - R & M / Improvement	-
209020	Building - Security Systems	-
209030	SOPAC Permanent HQ Complex	-
210010	Insurance - Travel	-
210020	Insurance - Motor Vehicle	-
210030	Insurance - Office Equipment	-
210040	Insurance - Property & Plant	-
211010	Electricity & Water	-
211020	Electricity Subsidy - Director	-
211030	Telephone & Fax	-
212010	Watchmen Services	-
212020	Cleaning & Sanitation Expenses	-
212030	Compound Maintenance	-
	Total Expenditure	**110,872.06**
	Task Balance as at 31st December 2009	**11,657.29**

Certified By:

Mohinish Kumar
Manager Corporate Services
19th April, 2010

PACIFIC ISLANDS APPLIED GEOSCIENCE COMMISSION
INCOME AND EXPENDITURE REPORT FOR YEAR ENDING DECEMBER 2009
FOR RT 2004.010 / PACIFIC ISLAND CLIMATE UPDATE

		ACTUAL FJD
700300	Opening Balance - 2008	27,829.62
	REVENUE	
100100	Program Admin Support Cost	-
100200	Member Country Contributions	-
100300	Fiji Government Grants	-
100400	Other Grants	-
100500	Interest on Investments	-
100600	Interest on Operating Account	-
100700	Exchange Gain & Loss	-
100800	Customs Refunds	-
100900	Transfer of Funds	-
101000	RXB Contributions	-
101100	XB Contributions	488,855.50
101200	Special Contributions	-
101300	Voluntary Contributions	-
101400	Miscellaneous Revenue	-
		-
	Total Revenue	**488,855.50**
	EXPENDITURE	
201010	Personnel Emoulments & related Cost	-
201020	Overtime and Relieving	-
201030	Job Training/Fellowships/Allowance	-
201035	Fellowships Allowance	-
201040	Appointment/Termination & Leave Costs	-
201050	Super Annuation	-
201060	Education Allowances	-
201070	Staff Insurance & Medical Cost	-
201080	Staff Insurance-In House Scheme	-
201090	Annual Leave-Gross	-
201100	Annual Leave-FNPF	-
202010	Airfares - Sopac Staff	-
202020	Airfares - Others	-
202030	DSA - SOPAC Staff	-
202040	DSA - Others	-
203010	Regional Workshop & Seminar	-
203020	In-country Workshop & Seminars	-
203030	Workshop Vehicle Support	-
203040	Workshop Supplies & Consumables	-
204010	Field Survey Area Expenses	-
204020	Analysis / Assays	-
204030	Survey Incidentals	-
204040	Field Work - General	-
204050	Data Storage Facilities	-
205010	Equipment Repairs & Maintenance	-
205020	Data Handling Equipment	-
205030	Image Acquisition	-
206010	Computer Accessories & Consumables	-
206020	Computer Software	-
206030	Computer Hardware	-
207010	Annual Session - Member Country Rep. Costs	-
207020	Annual Session - Other Costs	-
207030	Chairman & Sub-committee Costs	-
207040	Country Profile costs	-
207050	Support Costs	-
207060	Consultancy Fees	428,462.16

208010	Audit Fees	-
208020	Office Rent	-
208030	Printing and Reporting	-
208040	Subscriptions / Periodicals	-
208050	Stationary & Office Supplies	-
208060	Postage & Freight	-
208070	Taxi & Mileage Claims	-
208080	Advertising Costs	-
208090	Official Entertainment	-
208100	Incidental Expenses	-
208110	Office Furniture & Fittings	-
208120	Office Equipment Maintenance & Support	-
208121	Purchase of Office Equipment	-
208130	Operation/R & M - Motor Vehicle	-
208131	Purchase of Motor Vehicle	-
208140	General Office Sundries	20.00
208150	Special Expenditure	-
209010	Building - R & M / Improvement	-
209020	Building - Security Systems	-
209030	SOPAC Permanent HQ Complex	-
210010	Insurance - Travel	-
210020	Insurance - Motor Vehicle	-
210030	Insurance - Office Equipment	-
210040	Insurance - Property & Plant	-
211010	Electricity & Water	-
211020	Electricity Subsidy - Director	-
211030	Telephone & Fax	-
212010	Watchmen Services	-
212020	Cleaning & Sanitation Expenses	-
212030	Compound Maintenance	-
	Total Expenditure	**428,482.16**
	Task Balance as at 31st December 2009	**88,202.96**

Certified By:

Mohinish Kumar
Manager Corporate Services
19th April, 2010