

IMPLEMENTATION AGREEMENT
BETWEEN
THE POHANG UNIVERSITY OF SCIENCE AND TECHNOLOGY,
THE SECRETARIAT OF THE PACIFIC REGIONAL ENVIRONMENT PROGRAMME
AND
THE PACIFIC ISLANDS FORUM SECRETARIAT
FOR THE
REPUBLIC OF KOREA-PACIFIC ISLANDS CLIMATE PREDICTION SERVICES PHASE 2
PROJECT (2018-2020)

I. PURPOSE

1. Pursuant to the decision of the Ministry of Foreign Affairs of the Republic of Korea (“the **MOFA**”) and the Pacific Islands Forum Secretariat (“the **Secretariat**”) to strengthen the relationship between MOFA and Forum Island Countries (“**FICs**”), the ROK-PIF Cooperation Fund (“the **RPCF**”) was established to support training and capacity building programmes for FICs. The MOFA and the Secretariat as administrator of the RPCF, have jointly decided to provide RPCF funds to the Pohang University of Science and Technology (“the **POSTECH**”) and the Secretariat of the Pacific Regional Environmental Programme (“the **SPREP**”) to implement the Republic of Korea-Pacific Islands Climate Prediction Services Phase 2 (“**ROK-PI CliPS 2**”) project (“the **Project**”), on the terms and conditions contained in this Implementation Agreement (“the **Agreement**”).

II. ACCOUNTABILITY

2. POSTECH and SPREP as implementing agencies for the Project, recognize that they have substantive responsibility for all activities whether implemented directly, or by another organization on its behalf as part of the agreed 2018 Joint Annual Work Plan and Budget (“**2018 Work Plan**”) and in the succeeding Annual Work Plans to be developed.

3. Each of the implementing agencies is responsible to the Secretariat for the portion of the funds allocated to it for the implementation of the activities outlined in the 2018 Work Plan (Annex 1) and in the succeeding Annual Work Plans to be developed and will diligently, effectively and professionally implement those activities



III. FUNDS PROVIDED BY THE SECRETARIAT

3A. The implementing agencies shall adhere to the following estimated budgets (Tables 1 and 2) and the detailed estimates contained in Annex 1; Attachments 1, 2 and 3 as closely as reasonably possible:

Table 1: Estimated Budget for 3 Years 2018-2020.

Unit: 1,000US\$

CONTENTS		BUDGET			
Category	Sub-Category	2018	2019	2020	Total
Producing and providing high quality tailored climate prediction information with integration with other models	Establishment of the Consensus of Climate Outlooks (CoCO) Function	183.1	172.6	170	525.7
	Training of the Climate Information Application	125	150	135	410
	Communications and Visibility	52.54	38.04	55.64	146.22
	Project Coordinator	104	104	104	312
Management Fees	PIFS	72	72	72	216
	POSTECH	35.4	35.4	35.4	106.2
	SPREP	27.96	27.96	27.96	83.88
TOTAL		600	600	600	1,800

Table 2: Funding Allocation for 3 Years.

Unit: 1,000US\$

Year/Agency	2018	2019	2020
POSTECH	295	295	295
SPREP	233	233	233
PIFS	72	72	72
Total	600	600	600

3B. Each party to the Agreement may claim an amount equivalent to 12% of the portion of the funds allocated to it under the Estimated Budget (Table 2) as a management fee to offset overhead expenses in implementing the activities.

4. The expenditure for the implementation of the activities will be in accordance with the amount of financial assistance stipulated in each Annual Work Plan and any alterations that may be agreed upon between the Secretariat and the implementing agencies from time



to time during the program timeframe. The funds will be disbursed to the implementing agencies by direct funds transfer upon receipt by the Secretariat of an invoice from the implementing agencies, as well a written request outlining activities to be supported under the funding with associated budgets.

5. In order for the Secretariat to disburse funds to the implementing agencies, it must receive a request signed by an authorizing official confirming the need for funds and the accuracy of the information provided with the request for the funds. The following individual(s) are authorized by the implementing agencies to incur expenditures and request direct funds transfer and certify expenditure reports of funds used in the Project.

Name	Title	Signature
Jong-Seong Kug	Professor, POSTECH	
Tagaloa Cooper-Halo	Director, Climate Change Resilience, SPREP	

6. The Secretariat will transfer funds to the designed bank account below for the purpose of implementing the activities outlined in the request for funding and in accordance with the budget.

POSTECH	
Bank Name	: Woori Bank
Bank Address	: 77 Cheongam-Ro, Nam-Gu, Pohang Gyeongbuk, Republic of Korea 37673
Bank Account Title	: Research & Business Development Foundation, POSTECH
Bank Account Number:	: 494-093936-13-009
SWIFT Code	: HVBKRRSE

SPREP	
Bank Name	: Bank South Pacific (BSP) (Samoa), Ltd
Bank Address	: Beach Road, PO Box 1860, Apia, Samoa
Bank Account Title	: SPREP USD Working account
Bank Account Number:	: 01-849599-07
SWIFT Code	: BOSPWSWS



IV. FINANCIAL AND NARRATIVE REPORTS

7. The implementing agencies shall provide a joint POSTECH/SPREP six-monthly and annual financial reports to the Secretariat setting out actual expenditures incurred and disbursements made during the two periods (ie. 6-months and 12-months) and any unexpended funds in the Project

7A. Financial and Narrative reporting shall adhere to the following timeline (Table 3)

Table 3: Deadlines for Financial and Narrative Reports.

Deadline	Report
30 June 2019	Six-monthly financial and narrative report
31 December 2019	First annual financial and narrative report
30 June 2020	Six-monthly financial and narrative report
31 December 2020	Project completion financial and narrative report

8. All joint POSTECH/SPREP financial and narrative reporting to the Secretariat will be prepared by the authorizing officer stipulated in Part III of this Agreement preferably in US dollars. All reports are to be submitted to the Secretariat in English.

V. PROGRAMME DEADLINE AND RELATED MATTERS

9. The Programme will be completed by either the 31 December 2020 or within a permissible extension period of 12 months afterwards, provided that during such period there shall be no increase to the approved budget outlined in clause 3A above.

9A. If the permissible extension period is to be relied upon, notice shall be made in writing by the implementing agency to the RPCF through PIFS at least three (3) months prior to the completion date in clause 9 above.

9B. During the permissible extension period, the requirements for financial reporting set out in Part IV of this Agreement shall remain strictly adhered to.

9C. Within sixty (60) days of the date of Project completion, the implementing agencies will jointly submit and transfer:

- a) a project completion report;
- b) a financial statement; and
- c) any unexpended balance of funds to the Secretariat’s designated bank account



VI. GENERAL

10. Each Implementing Party will keep and maintain all information, data and financial records (“Records”) relating to the management and implementation of this Agreement in accordance with prudent business practice and all applicable laws. Each Party is also responsible for ensuring that the Records are easy to access.

11. Intellectual Property in all project materials developed or produced under this Agreement, including any training materials will vest in the Implementing Agencies, unless otherwise stipulated in this Agreement.

12. This Agreement constitutes the entire agreement between the parties and supersedes all communications, negotiations, arrangements and agreements, either oral or written, between the parties with respect to the subject matter of this Agreement.

13. It is understood by all the parties to this Agreement that any public relations materials regarding this Project should stipulate that this Project is funded under the RPCF arrangement between MOFA and the Secretariat and jointly organized and implemented by POSTECH and SPREP.

14. This Agreement may be amended at any time, in writing, through the mutual consent of PIFS, POSTECH and SPREP.

15. Disputes arising from the interpretation or implementation of this Agreement will be settled through mutual consultations between the implementing agencies and the Secretariat.

16. This Implementation Agreement will enter into effect on _____ 2018.



Signed in duplicate at _____ on the ___ day of _____, 2018
in the English language.

**FOR THE POHANG UNIVERSITY OF
SCIENCE AND TECHNOLOGY**

**FOR THE SECRETARIAT OF THE PACIFIC
REGIONAL ENVIRONMENT PROGRAMME**



Hyungseop Kim
Executive Director

**Research & Business Development
Foundation, Pohang University of
Science and Technology**



Kosi Latu
Director General

**Secretariat of the Pacific Regional
Environment Programme**

Dame Meg Taylor
Secretary General
Pacific Islands Forum Secretariat

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**REPUBLIC OF KOREA: PACIFIC ISLANDS CLIMATE PREDICTION SERVICES PHASE 2
PROJECT (ROK PI CliPS-2)**

1. Project Background

The ROK PI CliPS-2 is a climate prediction information project for climate change capacity building of the Pacific Islands region. The Republic of Korea-Pacific Islands Climate Prediction Services (ROK-PI CliPS) project, funded by the Government of Korea through the Pacific Island Forum Secretariat (PIFS), and implemented by the APEC Climate Center (APCC) and the Secretariat of the Pacific Regional Environment Programme (SPREP), was a four-year project that began in 2014 and came to a close on December 31st, 2017.

Through the ROK-PI CliPS project, APCC and SPREP gathered a great amount of knowledge regarding the capacity of the Pacific Islands to generate and utilize high quality climate prediction data. ROK-PI CliPS provided the Pacific Island region with two major products: (1) the Climate Information ToolKit for the Pacific (CLIK-P), and (2) the Pacific Island Countries Advanced Seasonal Outlook (PICASO), which allow Pacific meteorological officers to combine climate models from 9 different global meteorology centers to develop regional climate predictions over any three month period, and to generate their own localized prediction and seasonal outlooks, respectively. CLIK-P and PICASO have been well-received by the Pacific Meteorological Services, as indicated by their support during the 4th Pacific Meteorological Council (PMC-4) in Honiara, Solomon Islands, and 3rd Pacific Islands Climate Outlook Forum (PICOF-3) in Apia, Samoa.

During the 3rd Korea-Pacific Islands Foreign Ministers' Meeting, the Ministers welcomed the implementation of "2014-2017 Pacific Islands Climate Prediction Services Project", and during the PMC-4, the PMC "requested additional resources to develop a **user-friendly integrated approach** to determine the optimal prediction for higher quality forecast information in the Pacific Islands; and requested additional resources for communication, **capacity building and training of NMHS¹** and in-country stakeholders to ensure that the tools and products developed by ROK-PI CliPS are taken up for decision making in sectors such as Agriculture, Health, Water, Disaster Risk Reduction, and so on."

Upon the completion of the project, the Meteorological Services brought two particular needs that still remain to be addressed to APCC and SPREP's attention:

1. simple and user-friendly method to compare different prediction models to determine the highest skill forecast for a specific station in a specific season
2. increased capacity building for the sustained systemized usage of the highest quality climate information available in the Pacific Islands.

Therefore, the ROK PI CliPS-2 project would like to address the above two needs through a follow-up project funded by the RPCF. We believe that we can address the two above needs through two separate outputs, respectively:

¹ National Meteorological and Hydrological Services



1. integrated forecast function in PICASO;
2. PICASO region, sub-regional, and in-country Training Programs.

2. Main Objectives

Increasing the resilience of the Pacific Islands through strengthening their capacity for the utilization of high quality climate prediction information – The project aims to build the resilience of the Pacific Islands to climate change through the strengthening of the NMHS capacity to contribute to community resilience and national development planning. The tailored region-specific climate prediction system developed during the ROK PI CliPS project, will be updated and enhanced.

This initiative will build on previous activities such as the ROK PI CliPS project completed in 2017, and work in partnership with current relevant activities such as those implemented by the Pacific Meteorological Desk (Pac Met Desk) Partnership and the Climate, Oceans Support Programme for the Pacific (COSPPac) Project based at SPREP.

3. Strategic Plan

Due to the large number of climate models available to the Pacific Islands region as well as potential development of future models, it is very difficult for Pacific NMHS to develop a consensus forecast utilizing multiple prediction systems to inform their decision-making process while generating their seasonal outlooks. The Consensus of Climate Outlooks (CoCO) function intends to minimize the difficulty of integrating the prediction systems in order to ensure that the Pacific Islands are utilizing all available high quality information when making climate information-based policy decisions.

CoCO can also be utilized to inform the Pacific Islands Climate Outlook Forum (PICOF) when developing a regional consensus forecast, which will allow for this forecast to be better utilized in sectors, as mandated by the World Meteorological Organization. CoCO will also be installed in the already launched and operational Pacific Island Countries Advanced Seasonal Outlook (PICASO) system developed during ROK PI CliPS, enhancing the usability and familiarity of the system.

Upon the installation of CoCO into PICASO, POSTECH will assist the PICT² NMHS to self-operate the system by training participating NMHS in order for them to effectively analyze the information and apply the found data to the decision-making process.

² Pacific Island Countries and Territories



Consensus of Climate Outlooks (CoCO) Function

Currently, the two commonly utilized climate forecast systems in the Pacific Islands are PICASO and the Seasonal Climate Outlooks in Pacific Island Countries (SCOPIC). PICASO utilizes dynamical downscaled Multi-Model Ensemble data, and SCOPIC utilizes statistical information. Statistical models are based on data and are easy to build, and dynamical models are based the dynamics and physics of nature. Statistical models also do not take climate change into account, while dynamical models are more adaptable to a changing climate. Therefore, when combined and compared, these two models provide supplemental information that can provide a more informed and holistic climate prediction. There are also many other types of models that exist (hybrid dynamical-statistical, MME, etc.) that provide their own pros and cons that contribute when generating climate outlooks. CoCO seeks to integrate the available types of models to generate the highest quality consensus forecast for the Pacific.

Review of Scientific & Technical Research

Despite the past four years of work in the Pacific, there still needs to be background research conducted in order to fully understand the current operational forecast systems being utilized in the Pacific region. This review will allow the research team to form the basis of the development of CoCO based on not only other forecast systems in the Pacific, but also studies on forecast integration methodologies. There will also be additional research into the regional climate and drivers in the Pacific region to increase the reliability of CoCO and PICASO.

Development of Integration Algorithm

Based on background research, the team will develop an integration algorithm to scientifically integrate probabilistic forecasts. Most integration algorithms have involved deterministic forecasts, therefore, the development of integration algorithms for probabilistic forecasts will involve heavy scientific research.

Development of CoCO Function

Developing a user-friendly operational integrated probabilistic forecast function will be groundbreaking in the Pacific region. CoCO will be housed in PICASO, an already established and operational tool in the Pacific region, ensuring CoCO's widespread usage upon its launch.

Update of CoCO/PICASO

Based on feedback attained from Meteorological officers during events such as the training programs and visibility events, the team will make necessary updates to not only CoCO, but the PICASO tool as well. This may include updates such as changes to the user interface, addition of stations (based on data availability), export function updates, addressing technical bugs, and more. These contents will be subject to change based on the user needs.



Capacity Building

The team will build the capacity of the Pacific Island NMHS to understand the scientific aspects of hybrid dynamical-statistical downscaling, utilize PICASO, and utilize CoCO to generate a consensus forecast. This will increase NMHS capacities to be able to generate reliable forecasts.

Training Program

Through the previous ROK-PI CliPS project, we experienced that a combination of regional, sub-regional, and in-country trainings are the most effective way to increase capacity in the region while ensuring sustainability and increasing the utilization of the tools.

Online Climate Outlook Forum (OCOF)

The OCOF is a platform that allows NMHS to discuss their national climate outlooks on a monthly basis with regional mentors from SPREP and other organizations. Through this forum, the NMHS's are provided with mentoring and guidance when developing their climate bulletin for their national stakeholders. SPREP will work to incorporate PICASO into OCOF through this project and therefore, increase the capacity of the NMHS's to utilize PICASO when generating their climate bulletins.

PICASO Tutorial Videos/Manuals

For those NMHS officers that are unable to attend training programs, PICASO tutorial videos/manuals can serve as an alternative to in-person trainings.

Communications & Visibility

Project Visibility

The production of brochures, project videos, etc. will ensure the visibility and awareness of the project and project outcomes, helping to increase the likelihood that meteorological officers will utilize the project outputs (PICASO and CoCO) when generating climate outlooks.

Including PICASO in the SPREP monthly Climate Change Matters (CCM) newsletter and the project information in the Pacific Climate Change Portal will help increase general awareness of the project.

Project Communications

Delivering presentations at regional events such as PICOF, PMC, and Pacific Foreign Ministers Meeting will ensure the awareness of the project progress and project outcomes, helping to increase the likelihood that meteorological officers will utilize the project outputs (PICASO and CoCO) when generating climate outlooks. These opportunities may also be used to get feedback on the above systems for further development.



4. Role of PIFS

Management of the ROK-PIFS Cooperation Fund 2018-20 (“Cooperation Fund”)

- Liaise with the Government of the Republic of Korea on the funding of the Cooperation Fund
- Report to the Pacific Islands Foreign Affairs Ministers Meeting on the progress of the Cooperation Fund and the ROK PI CliPS-2
- Oversee management of the ROK PI CliPS-2 with the implementing agencies
- Administer the grant in accordance with the project Memorandum of Understanding between Government of ROK and PIFS, the Implementation Agreements with the implementing agencies and annual work plans

5. Role of Implementing Agencies

5.1 POSTECH

Establishment of a Consensus Climate Outlook (CoCO) function in PICASO in Collaboration with SPREP

- Review of scientific and technical research
- Research on regional climate and drivers in the Pacific region
- Develop an integration algorithm to scientifically integrate probabilistic forecasts
- Develop a user-friendly operational integrated probabilistic forecast function housed in PICASO
- Update CoCO and PICASO based on feedback attained from Meteorological officers during events such as training programs and visibility events

Capacity Building

- Prepare education programs and carry out course development in collaboration with SPREP
- Prepare SPREP to independently conduct successful in-country training programs
- Develop PICASO tutorial videos/manuals to serve as an alternative to in-person trainings

Project Visibility

- Deliver presentations at regional events such as PICOV and PMC
- Develop brochures, project videos, etc. to ensure the visibility and awareness of the project and project outcomes

Write Performance Reports for the Project

- Write a progress report (once per year) on POSTECH's activity
- Write an annual (or final) report on POSTECH's activity

Program Management

- Work with the CliPSCo and SPREP in monitoring and evaluation that will be based on agreed upon criteria
- Develop knowledge products, communications, and related materials with the CliPSCo and SPREP



- Perform other project management functions as may be required

5.2 SPREP

SPREP is to recruit a project coordinator to be known as the Climate Prediction Services Coordinator (CliPSCo) for the duration of the project through the ROK-PIF Cooperation Fund to help oversee the work for the project. It is recommended that the applicant has a Bachelor's degree or higher in Atmospheric Sciences or relevant field, while a Masters or Ph.D. holder with 2-year experience is preferred. The program coordinator's responsibilities will include the following SPREP roles (refer to the TOR attached).

Regional Coordination

- SPREP will liaise with other CROP agencies to ensure complementarity with other regional initiatives
- Ensure the inclusion of PICASO in the Online Climate Outlook Forums
- Coordinate the project regional trainings with other regional trainings on climate prediction

Research the Status of the Region

- Identify gaps or additional needs of the NMHSs in the PICs region to develop a Consensus Climate Outlook function

Organize and Conduct Training Programs

- Coordinate training of climate prediction information application
- Prepare education programs and carry out course development in collaboration with POSTECH
- Conduct in-country training programs as requested by NMHSs
- Conduct sub-regional training programs as requested by NMHSs
- Build on and work in partnership with existing and new activities (e.g., COSPPac)

Project Visibility

- Prepare and implement a communications and visibility plan to increase the visibility and awareness of the project and project outcomes
- Include PICASO activities and the climate summary in the monthly SPREP climate change matters (CCM) newsletter
- Include project information in the Pacific Climate Change Portal and the Pacific Meteorology website
- Include time in PMC and PICOFA agendas for ROK PI CliPS-2 progress and outcomes reporting
- Host side events at high level meetings such as the Pacific Foreign Ministers Meeting to increase the visibility and awareness of the project and project outcomes

Write Performance Reports for the Project

- Write a progress report (once per year) on SPREP's activity, collate report, and submit to PIFS
- Write an annual (or final) report on SPREP's activity, collate report, and submit to PIFS



- Develop and/or support publicity of the ROK-PIF Cooperation Research activity in the PIC region

Other Support

- The SPREP Director of the CCR and Climate Change advisers and adaptations will ensure the science of the projects is used to inform adaptation and risk reduction planning and implementation
- The CliPSCo will be part of the Pacific Met Desk Partnership to ensure project activities are aligned with other meteorology efforts as well as to the broader climate change and disaster risk reduction programmes in the region including PIMS, PRSCS FRDP, and WMO RA-V
- The CliPSCo will coordinate very closely with the Pacific Meteorological Council (PMC) and its expert group called the Pacific Island Climate Services (PICS) Panel and ensure that the project outcomes are related to the Pacific Island Regional Climate Centre (PI-RCC) and the Pacific Climate Change Centre
- SPREP will provide office space and other administrative support
- SPREP and/or CliPSCo will maintain and operate the seasonal prediction system and disseminate its products to the NMHS in the region

6. Yearly Plan

Activities	2018				2019				2020			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Review of scientific and technical research	■	■										
PICASO incorporated into OCOF	■	■										
Development of integration algorithm		■	■	■	■	■	■	■				
Software development for CoCO			■	■	■	■	■					
CoCO installed into PICASO							■					
Update PICASO and CoCO function								■	■	■	■	■
Regional Training Program				■				■				■
Sub-Regional Training Program		■				■				■		
In-Country Training Program					■	■	■	■	■	■	■	■
IT Training on PICASO maintenance							■				■	
Announcement of CoCO function at PMC/PICOF and gain feedback				■				■				■



[ATTACHMENT 1] Estimated Budget for the Year of 2018

Unit: 1,000US\$

PIF Charge	12% of the ROK-PIF Cooperation Fund	72
POSTECH Budget	Direct and management costs	295
SPREP Budget	Direct and management costs	233
Total		600

[ATTACHMENT 2] Estimated Budget for the Year of 2018: POSTECH

Unit: 1,000US\$

CONTENTS		COSTS	
Category	Item	Description	Amount
Establishment of the Consensus of Climate Outlooks (CoCO) Function	Review of scientific and technical research	77.5	77.5
	Development of integration algorithm	85.6	85.6
	Stakeholder engagement/ user interaction/ sustainability workshops	20 (1 person x 4 times x \$5000)	20
Training of the Climate Information Application	POSTECH Training Program Travel	30 (6 persons x 1 time x \$5000)	30
Communications and Visibility	Announcement of CoCO function at PMC/PICOF	30	30
	Communications and Visibility	16.5	16.5
Management Fee	POSTECH management fee	35.4 (12% of the POSTECH budget)	35.4
Total			295



[ATTACHMENT 3] Estimated Budget for the Year of 2018: SPREP

Unit: 1,000US\$

CONTENTS		COSTS	
Category	Item	Description	Amount
Establishment of the Consensus of Climate Outlooks (CoCO) Function	SPREP CliPS Coordinator	Basic salary, interview, settlement and other entitlements in accordance with SPREP Policy	104
Training of the Climate Information Application	PICASO/CoCO Regional Training Program	50 (1 training x \$50,000)	50
	PICASO/CoCO Sub-Regional Training Program	30 (1 training x \$30,000)	30
	PICASO/CoCO In-Country Training Program	15 (3 trainings x \$5000)	15
Communications and Visibility	Office Support	6.04	6.04
Management Fee	SPREP management fee	27.96 (12% of the SPREP budget)	27.96
Total			233

[ATTACHMENT 4] Estimated Budget for activities over 3 years

Unit: 1,000US\$

Contents		Budget			
Category	Sub-category	2018	2019	2020	Total
Producing and providing high quality tailored climate prediction information with integration with other models	Establishment of the Consensus of Climate Outlooks (CoCO) Function	183.1	172.6	170	525.7
	Training of the Climate Information Application	125	150	135	410
	Communications and Visibility	52.54	38.04	55.64	146.22
	Project Coordinator	104	104	104	312
	Management Fees	135.36	135.36	135.36	406.08
Total		600	600	600	1,800

