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KMA-funded & WMO-delivered Development Assistance Project Evaluations

2018

Korea Meteorological Administration

Preface

This project report is submitted by WeatherPia Inc. to KMA as the final English version of the project: “KMA-funded & WMO-delivered Development Assistance Project Evaluations”.

□ Evaluation agency : WeatherPia Inc.

□ Duration : May 2018 ~ November 2018 (6 months)

□ Evaluation team : Dr. Chun Woo LEE (replaced by Mr. JongBaek JEON) – Project Manager
: Ms. Kyeong Hwa HA – Main Evaluator
: Mr. SuSeok KIM – Sub-Evaluator
: Mr. Hwa Jong (Rich) LEE – Evaluation Assistant

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List of Acronym

ACMAD	African Centre of Meteorological Application for Development
AgM	Agriculture Meteorology
AGRHYMET	AGRrometeorology, HYdrology, METeorology
AMC	Aviation Meteorological Center (Mongolia)
AMOS	Aerodrome Meteorological Observation System
AWS	Automatic Weather System
ASPS	Aviation Meteorological Standard Data Processing System
CAAM	Civil Aviation Authority of Mongolia
CBS	Commission for Basic Systems
CIFDP	Coastal Inundation Forecasting Demonstration Project
COMS	Communication, Ocean and Meteorological Satellite
CPS	Country Partnership Strategy
CREWS	Climate Risk and Early Warning Systems
DAC	Development Assistance Committee
DANIDA	Denmark's development cooperation / Ministry of Foreign Affairs of Denmark
DARE	Data Rescue
DFID	Department for International Development
DMH	Department of Meteorology and Hydrology (Lao PDR)
DPFS	Data Processing and Forecasting System
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECMWF	European Centre for Medium-Range Weather Forecasts
EEC	Enterprise Electronics Corporation
EPS	Ensemble Prediction System
ER	Expected Result
FGI	Focus Group Interview
FMS	Fiji Meteorological Service
GEF	Global Environment Facility
GFCS	Global Framework for Climate Services
GK-2A	GEO-KOMPSAT-2A (Geostationary Korea Multi-Purpose Satellite)
HWR	Hydrology and Water Resources
IEDRO	International Environmental Data Rescue Organization
ISO	International Organization for Standardization
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JICA	Japan International Cooperation Agency
KAMA	Korea Aviation Meteorological Agency (現 Aviation Meteorological Office)
KMA	Korea Meteorological Administration
KMI	Korea Meteorological Institute
KMIPA	Korea Meteorological Industry Promotion Agency
KO	Key Outcome
KOICA	Korea International Cooperation Agency

KPI	Key Performance Indicator
LoA	Letter of Agreement
M&E	Monitoring & Evaluation
MDB	Multilateral Development Bank
MDGs	Millenium Development Goals
MHEWS	Multi-Hazard Early Warning System
MMO	Marine Meteorology and Oceanography
MOPAN	Multilateral Organization Performance Assessment Network
MoU	Memorandum of Understanding
NAMEM	National Agency for Meteorology and Environment Monitoring
NAS	Network-Attached Storage
NCA	National Capacity Assessment
NCEP	National Centers for Environmental Prediction
NCT	National Coordination Team
NIMET	Nigerian Meteorological Agency
NMHS	National Meteorological Services
NOAA	National Oceanic and Atmospheric Administration
NORAD	Norwegian Agency for Development Cooperation
NSEDP	National Socio-Economic Development Plan
NWP	Numerical Weather Prediction
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PC	Project Coordinator
PCN	Project Concept Note
PCM	Project Cycle Management
PDM	Project Design Matrix
PDMe	PDM for evaluation
PSG	Project Steering Group
PIP	Project Implementation Partner
PWS	Public Weather Service
RA	Regional Association
RSMC	Regional Specialized Meteorological Centre
RSIP	Regional Subproject Implementation Plan
RSMT	Regional Subproject Management Team
SAT	Site Acceptance Test
SDGs	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
SPC	Secretariat of the Pacific Community
SWFDP	Severe Weather Forecasting Demonstration Project
SWOT	Strengths, Weaknesses, Opportunities and Threats
TF	Trust Fund
ToC	Theory of Change
TOR	Terms of Reference
TOS	Typhoon Operation System

UKMO	UK Met Office
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UPS	Uninterruptible Power Supply
USAID	United States Agency for International Development
Uzhydromet	Centre of Hydrometeorological Service at Ministry of Emergency Situations of the Republic of Uzbekistan
VCP	Voluntary Cooperation Programme Fund
WCDMP	World Climate Data and Monitoring Programme
WIS	Welfare Improvement Strategy
WMO	World Meteorological Organization

1 Recommendations

1. Revising ToR of KMA-WMO

○ ToR Revision: The evaluation team learned from WMO that its project management arrangements have been evolving and strengthened. In this regard, the ToR for usage of funds provided by KMA would need to be reviewed with view to defining roles and responsibilities of KMA and WMO in this partnership. Important factors that can be discussed among KMA and WMO of building into the ToR include: sufficient flexibility in using provided funding by KMA, format and cycle of reports, project management mechanisms, detailed roles and responsibilities, evaluation methods, and etc. Any material changes in implementation arrangements should be discussed and agreed on between the two parties through continuous exchange of information and communication.

○ Strengthening role of regular meetings: In addition to a regular report, which has been an official way of reporting between the two, regular meetings should be given a greater role in order to increase mutual understanding. Both agencies should discuss not only project fund management, but also the strategy, policy, priorities, and relevance of ongoing projects to ensure projects and funds are managed in the best possible manner. Also, both have to designate respective focal points for frequent communication and effective fund management.

- The KMA is responsible for securing a budget from the Korean government and sending it to the WMO, as well as establishing, managing and reporting a budget plan for the following year based on the performance of projects which used the funding. On the other hand, the WMO is responsible for delivering a project in cooperation with dozens of donor agencies and around 200 Members. Naturally, they have differences in the way they manage a project and they have different needs.
- However, the evaluation team learned from an interview with the KMA and the WMO that both lack mutual understanding of their respective ways to manage a project and its funds.
- The evaluation team suggests that KMA and WMO learn about its internal requirements so as to build up better understanding and knowledge about respective internal processes. In this way, limitations would be communicated early on and solutions be found.

2. Developing and launching projects taking advantage of WMO's strengths

○ One of the strengths of multi-bilateral projects is that they can participate in global initiatives to contribute to addressing global issues. The WMO has strengths in undertaking projects related to global issues. By participating in the WMO's global initiatives such as DARE and

CIFDP, the KMA can contribute to addressing global issues, and at the same time it can enhance its status and influence in the WMO community.

○ Since it is difficult for one country to assess needs for the above projects or to undertake the projects themselves, these multi-bilateral projects can supplement bilateral projects, which is one of the advantages of multi-bilateral projects.

○ When it comes to global initiative projects, their framework, implementation plan, and structure are well-organized, contributing to increasing efficiency and effectiveness of projects. Also, since the WMO has to take the lead in implementing these projects, the projects can be more efficiently implemented than they would with a Project Concept Note provided by the KMA. The evaluation team took note of the advantages of supporting existing WMO global programmes since these are evidently in line with the WMO's Strategic Goals and Priorities, have existing frameworks, plans and structures, which are more effective, efficient, allows for wider outreach for KMA to countries than are not in the partner priorities and provide more value for the money to be provided by the KMA.

○ As the multilateral cooperation strategy agreed at the 24th meeting of the International Development Assistance Committee in February 2016 specifies multi-bilateral projects as a policy direction, the KMA can consider providing assistance for strategic countries by way of multi-bilateral projects through the WMO. For instance, it can consider offering assistance to South American or African countries through the WMO. Also, for countries which are not Korea's Priority Partner Countries but are significant in terms of policy, the KMA can provide assistance for them through multi-bilateral projects.

3. Increasing efficiency in launching multi-bilateral projects

○ One of the disadvantages of multi-bilateral projects is low efficiency. All five projects had delays in implementation.

○ The KMA provides funding to the WMO, the main operating and managing agency of multi-bilateral projects, because it trusts the WMO's operational capabilities. The involvement of KMA in the WMO's operation and management of project funds is not only to specify its requirements in the ToR concluded with the WMO but also to provide its experience and expertise anytime through the project period so as to increase visibility and contribution of KMA.

○ Therefore, to increase the efficiency of multi-bilateral projects, the KMA can consider having talks with the WMO aimed at revising the ToR with respect to project fund management,

which was concluded with the WMO in 2012. To improve the efficiency, the following have to be discussed between the two sides.

- Planning stage: The KMA has to participate in establishing plans for project monitoring and outcome management which is led by the WMO. Recent projects formulated Logframe such as PDM according to the WMO's strategic plans and performance management plans to set outputs, performance, and key indicators for measuring performance. Monitoring and performance management plans should be discussed to make sure the Logframe is established, managed, and implemented successfully, and thereby to increase the efficiency.
- The KMA also has to discuss securing the visibility of its assistance with the WMO, the CIFDP serving as a representative example of visibility.
- It is ideal that the WMO takes the lead in making a PCN with a preliminary feasibility study and stakeholders' workshop, and that the KMA reviews the PCN and shares its thoughts with the WMO to make a better project plan. This can make projects more feasible in terms of project duration and budget. The KMA can also consider participating in the preliminary feasibility study and stakeholders' workshop.
- Planning and implementation stage: The KMA performs monitoring to make sure projects are efficiently proceeded while they are undertaken by the WMO.
- At the implementation stage, the KMA can dispatch experts, or it can participate in project activities, in order to improve the quality of the projects and increase the KMA's visibility in the projects.
- Completion and evaluation stage: The KMA can participate in evaluation activities undertaken by the WMO. The evaluation should be conducted as result-based evaluation on the basis of performance indicators and output plans established at the planning stage.
- Post-management: To complement the sustainability of the projects even after they are completed, the KMA can increase efficiency and impact of the projects with other project-related activities, such as invitational training and technical support. Also, it can link the projects with follow-up projects on the basis of the needs identified during the project implementation.

○ The WMO, as the main operating and managing agency in multi-bilateral projects, should consider the following to efficiently implement multi-bilateral projects.

- Planning stage: Since the WMO is the project supervising agency, it is desirable that it takes the lead in making a PCN and performing various related activities. In this way, realistic and reasonable project duration and budget should be designed.
- Outputs, performance indicators, and monitoring and evaluation (M&E) plans should be established by making a Logframe. In this process, the WMO should have sufficient talks with the recipient countries. Also, performance management measures, such as KO and KPI which are used by the WMO, should be actively incorporated into projects, in order to allow monitoring and performance management to be successfully conducted.

- During a technical review, equipment and systems for projects should be designed by taking into account local circumstances. Also, efforts have to be made at the planning stage to input the most appropriate technology and system in the project, such as by ensuring a sufficient time for technical reviews and putting experts with adequate expertise into the projects.
- Planning and implementation stage: Risk and issue management should be strengthened. All five projects had delays in implementation because issues occurred in connection with project schedules. Also, budget related risks and issues should be tightly managed. Potential risk factors should be considered in advance and be reflected in risk management plans. Risks and issues, which should be considered at the planning and implementation stage, include customs clearance period, selection of implementing entities, and political, economical and social changes in recipient countries.
- Funding management reporting system should be improved through discussion with donor countries. Requirements from donor countries should be adequately reported to the WMO, whereas donor countries should have better understanding of the WMO's system.
- The WMO is currently revising the WMO Project Management Guidelines and Handbook. Also, it is making an effort to improve its capacity of project management, including ePM system development, Elios, and Oracle Dashboard system operation. The WMO should fully share the Guideline and Handbook and management related information with donor agencies in order to increase the efficiency and effectiveness of projects and funding management.
- Performance management: Logframe should be actively utilized in the project. The WMO's performance management indicators should be applied to and used when designing the Logframe.

○ When the KMA dispatched its staff member from 2014 to 2015, project activities that had been going slowly were able to pick up the speed and the KMA was able to obtain necessary data. In this sense, dispatching a staff member from the KMA, who is capable of managing or supporting WMO's multi-bilateral projects, can be considered as a way to increase the efficiency of projects.
- However, the role of the dispatched staff member should be clearly defined, in consultation with the WMO.

○ The evaluation team recognized that project management and coordination require sufficient resourcing so also to ensure more seamless information sharing between reporting periods. In this regard, providing financial resources to accomplish this within the KMA funding would help increase efficiencies, and avoid delays, ensure continuous information sharing. Additionally, as the executing agency of projects, WMO would ensure regular monitoring of projects. KMA could participate in monitoring/ project site-visits. These need to be specified in the projects monitoring plans to discussed at the project preparation stage.

○ The evaluation team recognized the need for visibility of KMA's assistance to WMO. A

visibility strategy can also be discussed and agreed between KMA and WMO and included in a revised TOR, with funding allocations.

<Table 2> Summary of efficiency improvement measures

	Planning	Implementation	Completion and evaluation	Post-management
KMA	• Participating in establishing monitoring and performance management plans • Participating in establishing plans for securing its visibility • Providing funds • Reviewing PCN • Participating in pre-feasibility studies and stakeholders' workshop	• Monitoring • Supporting projects and securing its visibility -Dispatching experts - Joining project activities	• Participating in joint on-site evaluation	• Connected activities - Technical support - Capacity building, etc.
WMO	• Establishing monitoring and performance management plan • Establishing plans for securing its visibility • Making PCN - Including Logframe (performance indicators, outputs, M&E, ect.) • Holding a preliminary feasibility studies and stakeholders' workshop	• Strengthening procurement process • Managing projects and their performance - Using project management system -Interim evaluation • Strengthening risk and issue management	• Performance management based on performance indicators - End-of-project evaluation • Joint on-site evaluation	• Plans for securing sustainability - Exit strategy - Follow-up measures

2 Evaluation Results

2.1 Analysis of KMA-WMO Development Assistance Projects

2.1.1 Project Evaluation Criteria

○ The evaluation team evaluated KMA's five projects delivered by the WMO and gave a rating to each project. The result shows that two projects were evaluated as "successful" and one project was "somewhat successful" (Projects in Mongolia and Fiji were excluded from the evaluation because they are still ongoing). Projects in West Africa and Fiji assisted by the WMO Global Initiatives received overall high scores in relevance and efficiency.

<Table 3> Evaluation rubric for five projects (Only three completed projects were evaluated)

Very successful	Successful	Somewhat successful	Unsuccessful
14 or above	11.00 to 13.99	8.00 to 10.99	Below 8
0	2	1	-

<Table 4> Evaluation results of five projects

	Project	Relevance	Efficiency	Effectiveness & Impact	Sustainability	Total
	Total	4.00	4.00	4.00	4.00	16.0
1	Installation of COMS Receiving System Project in Lao PDR	3.33	2.25	2.50	2.00	10.1
2	Uzbekistan Climate Data Rescue Project	3.33	2.75	3.00	3.25	12.3
3	Severe Weather Forecasting Demonstration Project (SWFDP) in West Africa (Phase I)	3.33	2.38	3.00	2.75	11.5
4	Modernization of Aviation Meteorological Services in Mongolia (Phase II)	3.00	0.50	-	-	
5	Coastal Inundation Forecasting System in Fiji (CIFDP-Fiji) (Phase II-IV)	3.67	3.25	-	-	
	Average	3.33	2.23			

2.2 Installation of COMS Receiving System Project in Lao PDR

2.2.1 Project Overview

1. Project background

○ The Korea Meteorological Administration (KMA) agreed to carry out projects to assist developing countries, in collaboration with the World Meteorological Organization (WMO). In line with this, the KMA created the Korea Climate Service Trust Fund (referred to as Korea CS TF) in November 2012. Since then, in 2012, it started to select beneficiary countries and develop projects for them every year in order to support the selected countries.

- Starting from Lao PDR in 2012, it has assisted projects launched in Uzbekistan, Mongolia, West Africa (SWFDP), and Fiji (CIFDP-F).

○ Since Lao People's Democratic Republic (PDR) is vulnerable to climate and weather related disasters, it was in urgent need of assistance for developing its meteorological technology that can contribute to climate change adaptation and disaster risk reduction. The country also often experienced damage from typhoons, frequent flooding, and heavy rain. Back in 2012, for example, it was severely damaged by Typhoon Haima and Nockten.

○ To prevent and respond to these disasters, the Laos Ambassador to the Republic of Korea and some members of the Lao National Assembly requested support from the KMA to enhance its meteorological system with a view to increasing its early warning capability. At the Lao PDR's request, the KMA agreed to offer the country a satellite data receiving system for Communication, Ocean and Meteorological Satellite (COMS) to help improve the forecasting capacity of the Department of Meteorology and Hydrology (DMH). It then decided to provide the system through the WMO.

○ The KMA (donor), the WMO (international organization), and the DMH (recipient) conducted a preliminary technical survey in March 2013 to install Installation of COMS Receiving System Project. The survey identified appropriate locations for the system installation, available personnel capable of operating the system, and necessary equipment.

○ After the technical survey, the WMO reviewed technical conditions in September 2013, confirmed specifications for the system, and issued a public tender from September to October in 2013. As a result, it selected the Enterprise Electronics Corporation (EEC) as a project-implementing agency and signed a contract in June 2014 to implement the project in earnest.

2. Project overview

		Descriptions
Goals	Overall goal	• To improve capacity for responding to severe weather and disasters
	Mid-term goal	• To enhance severe weather monitoring by receiving and processing real-time COMS data
	Short-term goal (Outputs)	• To install COMS data receiving system • To strengthen capacity of the DMH's staff for system operation
Roles	KMA	• Providing funds • Dispatching experts (one secondee)
	WMO	• Project supervision and management
	EEC	• Purchasing equipment and materials • Installing the system • Dispatching specialists • Providing training
	Recipient (DMH)	• Providing a site for the satellite system installation and setting up conditions for the system
Project site		Vientiane, Laos
Size/Duration		USD 264.137.36 (approx. KRW 297 million) From November 2012 to April 2015 (30 months)
Beneficiary		DMH and related government agencies (Disaster Management Office, Ministry of Labor and Social Welfare, Ministry of Agriculture)
Project entities	Funding agency	• KMA
	Recipient	• DMH
	Supervising agency	• WMO
	Implementing agency	• EEC

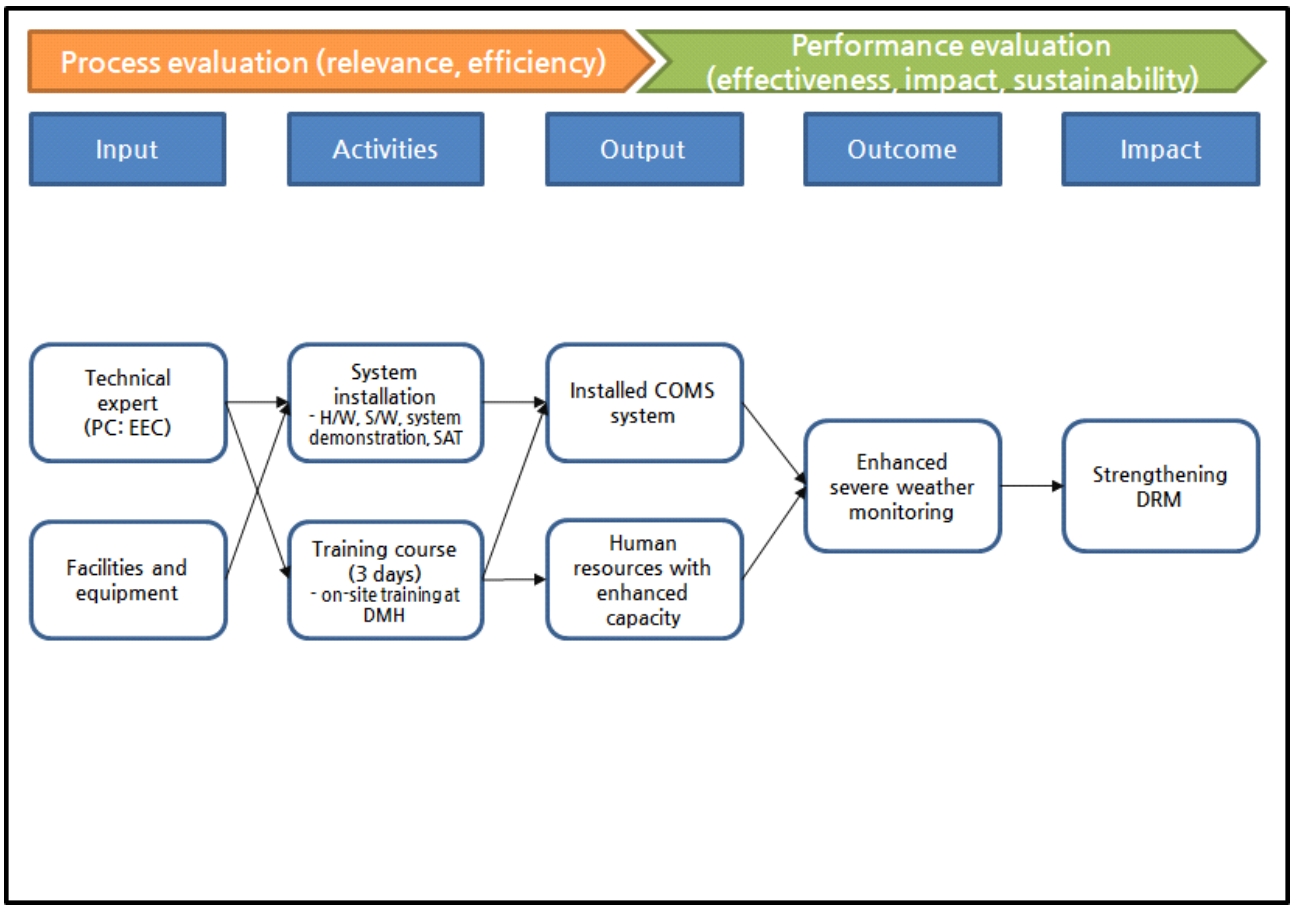
3. Project Design Matrix

A. Performance matrix

○ When this project was designed, a Project Design Matrix (PDM) was not established. The evaluation team, however, established a PDM for evaluation (PDMe) for project evaluation.

○ In addition, the evaluation team established an evaluation frame based on the Theory of Change (ToC) to utilize it for evaluating processes and performance of the project.

<Figure 2> ToC of Installation of COMS Receiving System Project in Lao PDR



<Table 5> PDMe for Installation of COMS Receiving System Project in Lao PDR

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification (MOV)	Important Assumption
Overall Goal To strengthen capacity of disaster risk management			
Outcomes Enhanced severe weather monitoring by receiving and processing real-time COMS data	1. Utilization rate of COMS data for forecasting	1. On-site interview	1. Securing budget and human resources for continued operation and maintenance of the system 2. System upgrade (when necessary)
Outputs 1. Completed the installation of real-time satellite data receiving and processing system for the KMA's COMS 2. Increased use of the system, and strengthened capacity of staff members involved in system operation	1. Whether the system installation is completed 2. Whether satellite images can be received 3. The number of trainees, and the level of their satisfaction with training	1-1. Reports on the project results (Site acceptance test sheet, final report, etc.) 1-2. On-site inspection 1-3. System failure log 2. Received satellite images 3-1. List of trainees 3-2. Interview with training participants	1. Maintaining a good state of the system, and (when necessary) carrying out appropriate maintenance 2. Continued training on satellite data analysis and its application for the staff involved in system operation
Activities	**Inputs**		**Pre-conditions**
1. Installing the COMS data receiving system - H/W, S/W, system demonstration, SAT 2. Training course (3 days) - on-site training at DMH	1. KMA: Funding of USD 264,000 - Dispatching one expert (WMO Secondee) 2. WMO: Supervising the overall project - Funds for the Secondee (approx. USD 130,000) 3. EEC: Implementing agency (approx. USD 110,000) : Installing COMS data receiving system - Satellite data receiving and processing system - Training on system operation and maintenance - Dispatching experts 4. DMH-Lao PDR: Recipient - Provision of project site - Providing convenience for the project, including human resources and office		1. Selecting an appropriate qualified implementing agency, and inputting experts 2. Clear division of roles and responsibilities among stakeholders, and execution of their own tasks 3. Securing an appropriate location for the system installation 4. Selecting appropriate qualified human resources, and providing training for them

4. Project process

○ The International Cooperation Division of the KMA provided the WMO with funding for this project, and dispatched one expert to the WMO as a secondee from November 2014 to September 2015 in order to follow up the progress of the project and assist the project management.

○ The WMO, the project supervising agency, was responsible for selecting a project implementing agency and managing the overall process of the project, including executing a budget, submitting an annual report to the KMA.

○ The WMO also sent one of its technical consultants to the project site in Lao PDR for a technical survey in preparation for an international public tender for the project. Based on the survey results, the WMO's relevant division reviewed technical specifications in September 2013.

○ Enterprise Electronics Corporation (EEC), an American company, was designated as the project implementing agency. The WMO signed a contract with the EEC.

- The evaluation team identified that a collaboration system, such as video call and email, was established between the working-level staff from the EEC and the DMH.

5. Project timeline

- ○ Nov. 2012 KMA sent funds to the WMO Climate Service Trust Fund for the project of Satellite Data Receiving System for the Communication, Ocean and Meteorological Satellite (COMS) in Lao PDR.
- ○ Mar. 2013 KMA and the WMO jointly conducted a preliminary technical survey.
- ○ Sept. 2013 WMO recruited experts for reviewing specifications and completed the review.
- ○ Sept. to Oct. 2013 WMO issued an international public tender.
- ○ Nov. 2013 WMO completed a technical evaluation, and designated the EEC[1] as a project implementing agency.
- ○ Jan. 2014 WMO sent the EEC a Letter of Clarification for technical negotiation.
- ○ Jun. 2014 WMO signed a contract with the EEC.
- ○ Nov. 2014 KMA sent a secondee to the WMO and managed the project.
- ○ Mar. 2015 EEC transported equipment.
- ○ Apr. 2015 EEC installed the system and completed training.
- ○ Apr. 2015 KMA and WMO jointly conducted a Site Acceptance Test (SAT)[2] and completion evaluation, and completed the project.
- ○ Jul. 2015 WMO submitted a project completion report to the KMA.

1) Three companies — Soletop (Korea), Enterprise Electronics Corporation (USA), and Sea Space (USA) — participated in the public procurement tender.

2) Site Acceptance Test

2.2.2 Evaluation Results

1. Main Evaluation

○ The evaluation team set evaluation indicators for each of five evaluation criteria recommended by OECD/DAC — Relevance, Efficiency, Effectiveness, Impacts, and Sustainability — along with cross-cutting issues of gender equality and environment, to evaluate the performance of this project. In addition, considering that it was a multi-bilateral project, the team also added two criteria, related to the use of the recipient country's system and whether the project relates to, and complements, bilateral projects.

- **Relevance** is a criterion that assesses the process of selecting inputs and their relevance to a project by considering a donor country's assistance policy and recipient country's priorities and development needs.
- **Efficiency** is a criterion that assesses whether various inputs are optimally utilized in terms of time and cost, and thereby whether the inputs are converted into outputs, by considering the environment of a project.
- **Effectiveness** is a measure of the extent to which a project attains its objectives on the basis of the project's performance matrix.
- **Impact** is a measure of the extent to which a project have impacts on society, economy, and institutions.
- **Sustainability** is a criterion that assesses whether positive benefits of an activity/policy of a project are likely to continue after the project has been completed. In other words, this measures whether changes and positive impacts produced by the project are likely to continue.
- **Relation and complementation** is a criterion that assesses whether a project is appropriate for a multi-bilateral project rather than a bilateral project, and that assesses whether a project has a potential to connect with, and supplement, a bilateral project of a donor country in the future.
- **Use of recipient's system** assesses whether a recipient country's sense of ownership is strengthened and expressed even in a multi-bilateral project.
- **Gender mainstreaming and environment** is a criterion that measures whether a project considers gender mainstreaming and environmental impacts in the entire project cycle, from planning to implementation to evaluation.

○ The evaluation team developed appropriate questions to each of the above criterion to evaluate projects.

<Table 6> Questionnaire on Installation of COMS Receiving System Project in Lao PDR

Criteria	Indicators	Questions
Relevance	Development strategy	Is this project consistent with the Lao government's development strategy and policy?
		Is this project consistent with the former country partnership strategy (CPS) of Laos and the KMA's international cooperation strategy?
	Development needs	Is this project consistent with the needs of the Lao PDR government?
	Consistency with MDGs	Is the objective of this project consistent with MDGs?
Efficiency	Cost efficiency	Was this project completed within the planned project duration and budget?
	Technical efficiency	Were technologies used in this project appropriate to local circumstances?
	Project implementation structure	Were the division of roles and cooperation system appropriate between stakeholders?
Effectiveness	Short-term effectiveness (Outputs)	Did this project achieve its objective against the goal?
		Did this project improve infrastructure and operational facilities of the DMH? (WMO KO 6.2)
	Mid-and long-term effectiveness	Did this project achieve outcomes against the goal?
		Did this project improve an access to seamless climate and meteorological data? (WMO KO 1.1)
		Did this project improve the delivery of PWS (public weather service and disaster information service)? (WMO KO 1.2)
		Did this project improve climate information and prediction for disaster management? (WMO KO 3.2)
Impact	Changes caused by project's impacts	Were there any social, economic, and institutional changes caused by the impacts of this project?
	Unintended impacts	What were the unintended impacts from this project?
Sustainability	Institutions & Human resources	Did this project secure human resources for continued operation of the COMS data receiving system?
	Finance	Did this project secure a budget for continued system operation and maintenance?
	Technology	Is this project possible to provide technical support for continued system operation?
Relation & Complementation	Relevance of project type	Is this project appropriate as a multi-bilateral project through the WMO?
	Relation & Complementation	Is this project linked with a bilateral project of the KMA? Also, does this project complement a bilateral project of the KMA?
Use of recipient's system	Use of system	Did this project use the system of the recipient country?
Cross-cutting issues	Gender mainstreaming	Did women participate in the project planning and implementation process?
	Environment	Did this project consider environmental impacts in the project planning and implementation process?

2. Evaluation results

A. Relevance

<Table 7> Relevance evaluation results of Installation of COMS Receiving System Project in Lao PDR

Evaluation items	Sub-items	Evaluation results
Policy and strategic consistency	Consistency with donor country's strategy	• This project is consistent with the Lao government's seventh National Socio-Economic Development Plan (NSEDP) (2011-2015) and Strategy, the State, and Needs of Meteorological and Hydrological Service (2011-2015 & 2016-2020).
	Consistency with Korea's ODA policy and assistance strategy	• This project is, directly or indirectly, consistent with focus areas of the first and second Country Partnership Strategy of Laos, as well as the KMA's internal policy direction.
	Development needs	• Lao PDR is vulnerable to climate change-induced meteorological disasters. It is in urgent need of assistance for meteorological technology development. • Since the country frequently experiences flooding including flash flooding, the northern mountainous areas highly need to strengthen its capacity of forecasting and warning against severe weather such as flooding and drought.
	Consistency with MDGs	• This project is indirectly consistent with MDG 7 — Integrating the principles of sustainable development into every nation's policies and programmes and also reversing the depletion of environmental resources under Ensure Environmental Sustainability.

B. Efficiency

<Table 8> Efficiency evaluation results of Installation of COMS Receiving System Project in Lao PDR

Evaluation items	Sub-items	Evaluation results
Economic efficiency of resource use	Efficiency of input resources	• It is impossible to evaluate whether this project was completed within the planned duration because the duration was not specified in the contract between the WMO and the implementing agency. - The time spent on administration work with the WMO accounted for 50% of the entire duration (30 months). • The expected budget was USD 264,137.36 (approx. KRW 297 million), but the total expenses spent on the project was USD 288,019.79. - As the installation of COMS system required less money than the planned expenses, there was some remaining budget. The KMA dispatched one member to the WMO in November 2014 for the efficient management of the project. The dispatchment was done with the project expenses.
Project implemen-tation structure & Technical efficiency	Efficient coordination and communication between stakeholders	• Main stakeholders involved in this project are the WMO, the EEC, the KMA, and the DMH. They had close communication, resulting in an efficient cooperation system among the stakeholders during the project.
	Technical efficiency	• Technologies used in this project was appropriate to the local situation. The preliminary technical survey, however, found out that surveys on specifications of the most suitable equipment and technology for the local situation and consideration of internal situation of the DMH were somewhat insufficient.

C. Effectiveness

<Table 9> Effectiveness evaluation results of Installation of COMS Receiving System Project in Lao PDR

Evaluation items	Sub-items	Evaluation results
Outputs	Installed COMS data receiving system	• When this project was completed in April 2015, the project achieved its outputs against the plan. • For the last six months after the project completion (February to August 2018), failures in display and power supply have disabled receiving satellite images. • Currently, the system is now back in operation, and receiving satellite images is possible as of September 2018.
	Enhanced capacity for operating the COMS data receiving system	• Training in system installation and system basics was delivered by experts from the EEC for seven trainees for three days, as planned. However, the training period an content were insufficient to enhance the capacity of the personnel of the recipient.
Degree of goal achievement	Enhancing the capacity of severe weather monitoring by receiving and processing real-time COMS data	• This project partially contributed to enhancing the severe weather monitoring capability by using COMS data for forecasting. • The system was not in a normal operation when this evaluation was conducted in August 2018. But the system is now back in operation as of September 2018, so this project is expected to achieve expected outcomes.
	Strengthening the capacity of disaster response management	• This project, in the long-term, is expected to contribute to improving climate information and prediction in relation to climate change adaptation and disaster management (KO 3.2), as well as strengthening the capacity of disaster response management which is the project's overall goal.

D. Impact (outlook)

<Table 10> Impact evaluation results of Installation of COMS Receiving System Project in Lao PDR

Evaluation items	Evaluation results
Changes caused by project's impact	• This project can contribute to improving the public's credibility and recognition of forecasting and warning through advanced observation with weather radars and satellites. • This project is expected to establish information-sharing and smooth cooperaton system with related government agencies, such as disaster response department, contributing to disaster responses in case of natural disasters. • This will minimize social and economic impacts from natural disasters, laying a foundation for the long-term national development for Lao PDR.
Unintended impacts	• The project has not had any unintended impacts, and will not in the future as well.

E. Sustainability (outlook)

<Table 11> Sustainability evaluation results of Installation of COMS Receiving System Project in Lao PDR

Evaluation items	Sub-items	Evaluation results
Possibility of project's self-sustainability	Policy and institutional sustainability	• This project is consistent with the DMH's disaster response strategy, and is placed on the DMH's priorities. The project is evaluated to have high policy and institutional sustainability. - As a result, if a follow-up project is implemented in connection with a follow-up satellite (GK-2A), the project's policy and institutional sustainability is expected to continue.
	Administrative and financial sustainability	• In terms of human resources and organization, this project is evaluated to have low administrative sustainability. - To date, two people completed training in COMS system operation. A lack of IT experts is an immediate challenge. - Invitational training by the KMA has enhanced the capacity of the DMH's staff members. But additional training for continued use and operation of the system has not been made within the DMH itself. • This project is evaluated to have low financial sustainability. - The field mission learned in August 2018 that fixing the malfunctioning display panel would require about 1,000 dollars. But due to a lack of a budget in the DMH and issues with spending priorities in the budget, the DMH was not able to fix the panel by itself.
	Technical sustainability	• This project is evaluated to have low technical sustainability. - Most technical support is dependent on the EEC, the project implementing agency.

F. Multi-bilateral evaluation

<Table 12> Multi-bilateral evaluation results of Installation of COMS Receiving System Project in Lao PDR

Evaluation items	Sub-items	Evaluation results
Multi-bilateral evaluation	Relevance of project type	• This project is considered more appropriate as a bilateral project rather than a multi-bilateral project delivered by the WMO. - In any satellite-related projects, it is critical to implement an associated system around the time of the satellite launch. In this sense, the efficiency of this project is somewhat low. (Project budget sent in November 2012 -> Contract with the EEC in June 2014 -> Completed the installation of COMS data system in April 2015.)
	Relation & Complement-ation	• This project can be related to future bilateral projects. A follow-up project can complement this project. - If this project leads to a follow-up project, it is considered to be more appropriate as a bilateral project.
	Use of recipient's system	• There are no particular issues. The recipient's thoughts were actively incorporated in the implementation process in terms of a location for COMS system installation.

G. Other criteria

<Table 13> Evaluation results of cross-cutting issue of Installation of COMS Receiving System Project in Lao PDR

Evaluation item	Sub-items	Evaluation results
Cross-cutting issues	Gender mainstreaming	• There is a high proportion of women in terms of users of COMS data receiving system (forecasters). But it seems that gender mainstreaming was not particularly considered in the process of project planning and implementation.
	Environmental impacts	• No particular environmental impacts

2.3 Uzbekistan Climate Data Rescue Project

2.3.1 Project Overview

1. Project background

○ Uzbekistan has used paper as a data archive medium since 1868 and until recently. This raised concerns over data loss. The country requested assistance from the KMA regarding efficient records management and data storage system. At the request of Uzbekistan, the KMA conducted a preliminary feasibility study[3] in 2012 through the Korea Environment Institute (KEI). The study showed that Uzbekistan's request has high project feasibility.

○ The KMA agreed to provide assistance for a climate data rescue project for Uzhydromet delivered by the WMO, with a view to enhancing the capacity of climate change response in Uzbekistan.

- The World Climate Data and Monitoring Programme (WCDMP) operated by the WMO promotes the development of climate data manage system through Data Rescue (DARE) projects.
- The KMA expected that assisting this project is part of its role as a member of the WMO Executive Council (EC), which will also help maintain the KMA's status at the EC, as well as building up a positive image of Korea in the WMO community.

○ The KMA conducted a preliminary technical survey in November 2013 to discuss roles and responsibilities of the KMA (donor), the WMO (international organization), and Uzhydromet (recipient), and to learn the current state of climate data preservation, the state of a project site, and necessary equipment in Uzhydromet.

○ The WMO, the supervising agency in this project, designated the International Environmental Data Rescue Organization (IEDRO), an American non-profit organization, as a project implementing agency and concluded a MoU. The recipient and the project implementing agency also concluded a Letter of Agreement (LoA) in May 2015 to start the project in earnest.

3) The KMA conducted a preliminary feasibility study on four countries — Vietnam, the Philippines, Kenya, and Uzbekistan — through a preliminary feasibility study on a project for climate data rescue and management system in development countries.

2. Project overview

		Descriptions
Goals	Overall goal	• To strengthen capacity of climate change research and severe weather management and response
	Mid-term goal	• To rescue old climate data of Uzbekistan (permanent preservation) • To increase the utilization of climate data • To make long-term climate forecasts and increase forecast accuracy
	Short-term goal (Outputs)	• Climate data rescue: converting paper documents to image files and digitize them (saving data to database) • To strengthen operational capacity of climate data rescue system • To install climate data rescue system
Roles	KMA	• Providing funds
	WMO	• Supervising the overall project
	IEDRO	• Purchasing equipment • Installing system • Dispatching experts • Education/training
	Recipient (Uzhydromet)	• Construction and renovation • Hiring local human resources • Others
Project location		Tashkent, Uzbekistan
Size/Duration		USD 617,032.58 (KRW 697 million) From February 2015 to September 2016 (20 months)
Beneficiary		Uzhydromet, academia using climate data service, research institutions, industry, the general public
Expected benefits		• Increased forecast accuracy by using digital data and consequently reduced damage from natural disasters • Meeting the needs of meteorological information from all sectors of Uzbekistan (economy, agriculture, etc.) and increasing convenience in disseminating meteorological information • Creating new jobs in Uzbekistan
Project entities	Funding agency	• KMA
	Recipient	• Uzhydromet
	Supervising agency	• WMO
	Implementing agency	• IEDRO

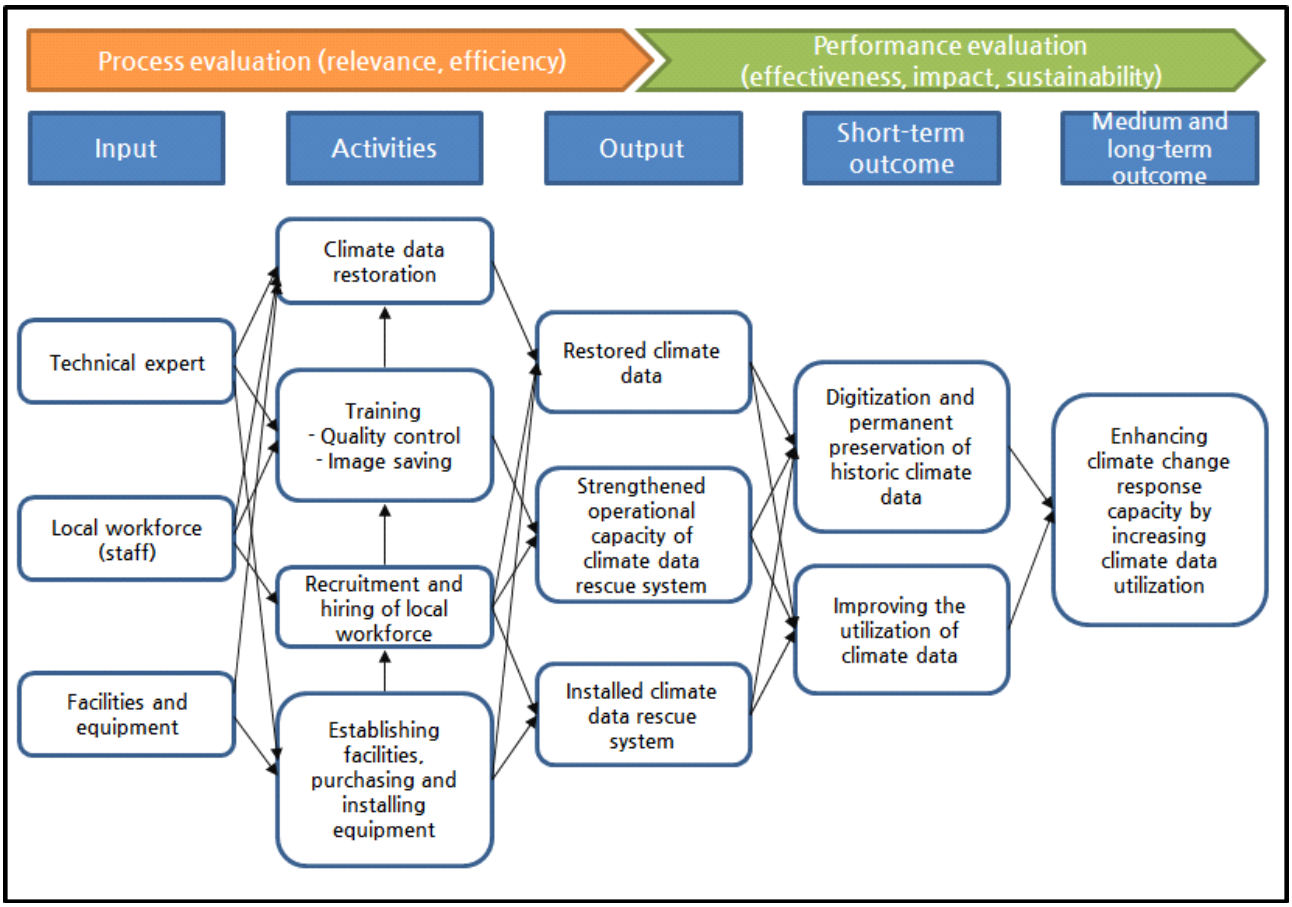
3. Project Design Matrix

A. Performance matrix

○ When this project was designed, a Project Design Matrix (PDM) was not established. The evaluation team, however, established a PDM for evaluation (PDMe) for project evaluation.

○ In addition, the evaluation team established an evaluation frame based on the Theory of Change (ToC) to evaluate the process and outcomes of the project.

<Figure 3> ToC of Climate Data Rescue in Uzbekistan



<Table 14> PDMe for Climate Data Rescue in Uzbekistan

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification (MOV)	Important Assumption
Overall Goal To improve utilization of climate data to strengthen capacity of climate change response			
Outcomes 1. Digitization and permanent preservation of historic climate data 2. Improved utilization of climate data	1. Rate of digitization of climate data 2-1. Increase in an access to climate data 2-2. Degree of increase in utilization of climate data 2-3. Frequency of inquiry and use of climate data	1. Uzhydromet climate data (system and stored data) 2-1. Interviewing Uzhydromet staff members in charge 2-2. Documents related to accessed climate information	1. Establishing operation mechanism and securing operation budget 2. Continuous training for personnel in charge of system operation 3. Maintaining a good state of system and proper maintenance
Outputs 1. Restored climate data 2. Strengthened operational capacity of climate data rescue system 3. Installed climate data rescue system	1-1. Amount of rescued climate data 1-2. Rate of digitization of climate data 1-3. Level of satisfaction of the recipient, and consistency with its needs 2-2. Whether a manual is published 3. Whether the system is installed and operated	1-1. Final project report, on-site inspection 1-2. Final project report, on-site inspection 1-3. Interview 2-1. List of training participants 2-2. Manual 3-1. Interviewing Uzhydromet staff members in charge 3-2. On-site inspection 3-3. Installation verification report 3-4. Daily operation log of system	1. Proper administration and personnel support of the recipient country 2. Systematic on-site training 3. Good state of rescued climate data
Activities	**Inputs**		**Pre-conditions**
1. Rescuing climate data 2. Training - Quality control - Saving images 3. Hiring local workforce 4. Establishing facilities, purchasing and installing equipment	1. KMA: Funding of USD 617,000 2. WMO: Supervising the overall project 3. IEDRO: Implementing agency (USD 155,000) : Project planning, system development, technical support 4. Uzhydromet: Recipient - Installing equipment - Recruit local staffs, charge of operations - Provision of project site and work area		1. Securing eligible and qualified project implementation agencies and experts 2. Allocating clear R&R(Roles and Responsibilities) among stakeholders

4. Project process

○ The International Cooperation Division of the KMA provided the WMO with funding for this project. The division ensured and managed the progress of the project through an annual report, without direct involvement of its personnel.

○ The WMO, the supervising agency in this project, was responsible for selecting an implementing agency and supervising and carrying out the overall project, including executing a budget, submitting an annual report to the KMA.

○ The International Environmental Data Rescue Organization (IEDRO), an American non-profit organization, was designated as an implementing agency of this project. The IEDRO concluded a MoU with the WMO to implement this climate data Rescue project. It has an experience with similar projects in the past with the support of other donor agencies, such as USAID and NOAA.

- The evaluation team learned that the IEDRO used IT experts to implement this project in an efficient and professional manner, and that it provided technical support in collaboration with climate data rescue experts from a Bulgarian university, installed climate data rescue system, and purchased and transported equipment to the project site.

○ Uzhydromet, the project supervising agency on the recipient side, had three staff members stationed on-site. In addition to this, Uzhydromet hired 15 people in the area of the project to operate and manage an image saving and related IT system, which are the key of the project.

○ The WMO concluded a LoA with the IEDRO and Uzhydromet, respectively.

- The IEDRO submitted a progress report on the project to the WMO to report how the project was progressed.
- The WMO and the IEDRO jointly conducted a field mission for a technical survey and project implementation in order to have close communication and cooperation.
- The evaluation team learned that collaboration system, such as video call and email, was established between working-level staff of the IEDRO and Uzhydromet.

5. Project timeline

- ○ Jun. 2012 KMA conducted a preliminary feasibility study on a climate data Rescue project for four countries including Uzbekistan.
- ○ Jun. 2013 KMA established a proposal for “Uzbekistan Climate Data Rescue Project in cooperation with the WMO.”
- ○ Aug. 2013 KMA sent funding to the WMO Climate Service Trust Fund for the Uzbekistan Climate Data Rescue Project, and submitted a Project Concept Note to the WMO.
- ○ Nov. 2013 KMA and WMO jointly conducted a preliminary technical survey.
- ○ Feb. 2014 KMA requested the WMO select a project implementing agency and consulted via emails.
- ○ Jun. 2014 WMO designated the IEDRO as an implementing agency, and concluded a MoU with the IEDRO for cooperation in Climate Data Rescue and Digitization.
- ○ Oct. 2014 WMO and IEDRO jointly conducted a field mission with experts from respective agencies.
- ○ Dec. 2014 – Mar. 2015 WMO, IEDRO, and Uzhydromet discussed respective roles (ToR) and drafted a LoA
- ○ Mar. 2015 Confirmed activities of each part of the project, duration, and budget
- ○ May 2015 WMO signed a contract with Uzhydromet and the IEDRO, respectively.
- ○ May 2015 WMO sent project funding to the Uzhydromet.
- ○ Jun. 2015 – Oct. 2015 Uzhydromet initiated Phase I of the project — Preparing and renovating an office for the project.
- ○ Oct. 2015 – Feb. 2016 Uzhydromet hired 15 local people and consulted with experts from the IEDRO about training for the local staff.
- ○ Mar. 2016 IEDRO conducted a field mission in Uzbekistan.
- ○ Apr. 2016 IEDRO & Uzhydromet began climate data rescue.
- ○ Oct. 2016 Extended the project duration (first extension: until August 2017)
- ○ Jul. 2017 KMA and WMO jointly conducted a completion evaluation of the project.
- ○ Aug. 2017 Extended the project duration (second extension: until February 2017)
- ○ Dec. 2017 Extended the project duration (third extension: until April 2018)
- ○ Apr. 2018 Completed the project

2.3.2 Evaluation Results

1. Main evaluation

○ The evaluation team developed appropriate questions to each of the above-criterion to evaluate projects.

<Table 15> Questionnaire on Uzbekistan Climate Data Rescue Project

Criteria	Indicators	Questions
Relevance	Development strategy	Is this project consistent with the Uzbekistan government's development strategy and policy?
		Is this project consistent with the former Country Partnership Strategy (CPS) and the KMA's international cooperation strategy?
	Development needs	Is this project consistent with the needs of the Uzbekistan government?
	Consistency with MDGs	Is the objective of the project consistent with MDGs?
Efficiency	Cost efficiency	Was this project completed within the planned project duration and budget?
	Technical efficiency	Were technologies used in this project appropriate to local circumstances?
	Project implementation structure	Were the division of roles and cooperation system appropriate between stakeholders?
Effectiveness	Short-term effectiveness (Outputs)	Did this project achieve outputs against the goal including climate data?
		Were the climate data rescue and data management system improved? (WMO KO 4.4)
		Did this project improve infrastructure and operational facilities of the Uzhydromet? (WMO KO 6.2)
	Mid- and long-term effectiveness	Did this project achieve outcomes against the goal?
		Did this project improve an access to seamless climate and meteorological data?(WMO KO 1.1)
		Did the project enhance research in climate for strengthening the capacity of long-term forecast? (WMO KO 5.1)
		Did this project improve climate information and prediction for climate adaptation disaster management? (WMO KO 3.2)
Impact	Changes caused by project's impacts	Were there any social, economic, and institutional changes caused by the impacts of this project?
	Unintended impacts	What were the unintended impacts from the project?
Sustainability	Institutions/Human resources	Did this project secure human resources capable of operating the climate data rescue system continuously?
	Finance	Did this project secure a budget for continued system operation?
	Technology	Is this project possible to provide technical support for continued system operation?
Relation & Complementation	Relevance of project type	Is this project appropriate as a multi-bilateral project delivered by the WMO?
	Relation & Complementation	Is this project linked with a bilateral project of the KMA? Does this project complement a bilateral project of the KMA?
Use of recipient's system	Use of system	Did this project use the system of the recipient country?
Cross-cutting issue	Gender mainstreaming	Did women participate in the project planning and implementation process?
	Environment	Did this project consider environmental impacts in the planning and implementation process?

2. Evaluation results

A. Relevance

<Table 16> Relevance evaluation results of Uzbekistan Climate Data Rescue Project

Evaluation items	Sub-items	Evaluation results
Policy and strategic relevance	Consistency with recipient's strategy	• This project is consistent with the Uzbekistan government's mid- and long-term national development plans — Welfare Improvement Strategy of Uzbekistan (WIS II 2013-2015) and Order of the Cabinet of Ministers of Uzbekistan on the improvement of Uzhydromet services (Dec. 2003).
	Consistency with Korea's ODA strategy and assistance strategy	• This project is directly and indirectly consistent with the focus areas of the first and second Country Partnership Strategy of Uzbekistan • The project is also consistent with the KMA's policy direction.
	Development needs	• The Uzbekistan government is highly interested in climate change response • There has been a high need of climate data preservation and use of climate data. - Uzbekistan has its own climate data since 1867.
	Consistency with MDGs	• The project is consistent with SDGs in the context of long-term outcome — strengthening response to climate change-induced severe weather events by restoring climate data of Uzhydromet.

B. Efficiency

<Table 17> Efficiency evaluation results of Uzbekistan Climate Data Rescue Project

Evaluation items	Sub-items	Evaluation results
Economic efficiency of resource use	Efficiency of input resources	• This project was implemented on the project budget. No additional budget was allocated during the project, but due to a lack of budget, data digitization was not implemented. • The project duration was extended three times until April 2018. It took 39 months in total, which was increased by 19 months from the initial plan
Project implementation structure & Technical efficiency	Efficient coordination and communication between stakeholders	• Close communication and cooperation were made among project agencies — WMO, IEDRO, and Uzhydromet.
	Technical efficiency	• The project used technologies suitable to local circumstances. During the technical feasibility study, surveying on the most appropriate equipment and technology was somewhat inadequate.

C. Effectiveness

<Table 18> Effectiveness evaluation results of Uzbekistan Climate Data Rescue Project

Evaluation items	Sub-items	Evaluation results
Outputs	Rescued climate data (Conversion of paper documents to image files to digitization (DB))	• Approximately seven million pages of climate data were converted into image files as compared to the target of 17 million pages. • Issues occurred such as a lack of budget and problems with connecting to climate data database software used by Uzhydromet since 1978.
	Strengthened operational capacity of climate data rescue system	• Training and hands-on practice by experts from the IEDRO strengthened the capacity of staff members responsible for operating the climate data rescue system in the recipient.
	Installed climate data rescue system	• Climate data rescue system was installed as planned.
Degree of goal achievement	Rescuing old climate data of Uzbekistan (permanent preservation)	• Out of 17 million pages of records at Uzhydromet, approximately seven million pages were restored, resulting in a permanent preservation of a half of the whole data. In this sense, the project achieved tangible results.
	Improving utilization of climate data	• If the rescued data are all digitalized through a follow-up project, this expects to contribute to improving the utilization of climate data.

D. Impact (outlook)

<Table 19> Impact evaluation results of Uzbekistan Climate Data Rescue Project

Evaluation items	Evaluation results
Changes caused by project's impacts	• The project hired 15 people in the area of the project, contributing to a temporary job creating for young people in Uzbekistan. • The project is expected to provide a variety of sectors in the society with necessary climate information and strengthen the capacity for climate change adaptation through research on climate change variability, leading to a foundation for the national economic growth of Uzbekistan in the long-term.
Unintended impacts	• The project has not had any unintended impacts so far, and will not in the future as well.

E. Sustainability (outlook)

<Table 20> Sustainability evaluation results of Uzbekistan Climate Data Rescue Project

Evaluation items	Sub-items	Evaluation results
Possibility of project's self-sustainability	Policy and institutional sustainability	• This project is consistent with climate change response strategy and priorities of the recipient country. The project is evaluated to have high policy and institutional sustainability.
	Administrative and financial sustainability	• Of 15 local people temporarily hired by the project, three were permanently hired. More people are planned be hired. • Uzhydromet is in preparation for its organizational restructuring since the new government has been in place. It plans to form a new division related to climate data rescue. • By drawing up its own budget, Uzhydromet plans to keep managing the data rescue system, just like its other equipment.
	Technical sustainability	• Uzhydromet used to receive technical support from the IEDRO via video calls or emails. But now a manager at Uzhydromet is skilled at dealing with the system, so the manager can smoothly use the system.

F. Multi-bilateral evaluation

<Table 21> Evaluation results of multi-bilateral aspects of Uzbekistan Climate Data Rescue Project

Evaluation items	Sub-items	Evaluation results
Multi-bilateral evaluation	Relevance of project type	• Considering the cost efficiency and effectiveness (outputs), this project is appropriate as a multi-bilateral project.
	Relation & Complementation	• A follow-up project (digitization) is appropriate to be delivered through the WMO, and that the follow-up project does not need to be implemented as a bilateral project.
	Use of recipient's system	• The project was implemented as a multi-bilateral project. It is positive that the recipient's system was used and a sense of ownership was expressed during the implementation process.

G. Other criteria

<Table 22> Evaluation results of cross-cutting issues of Uzbekistan Climate Data Rescue Project

Evaluation items	Sub-items	Evaluation results
Cross-cutting issues	Gender mainstreaming	• Women's participation was high in this project.
	Environment	• This project is helpful for the environment as it can contribute to reducing paper use in the future.

2.4 Modernization of Aviation Meteorological Services in Mongolia (Phase II)

2.4.1 Project Overview

1. Project background

○ The KMA conducted a feasibility study in 2012 for a project supporting the modernization of aviation meteorological services in Mongolia. The Aviation Meteorological Office (then known as KAMA, Korea Aviation Meteorological Agency), a KMA-affiliated agency, completed the first phase of the project in December 2013. The first phase of the project focused on improving flight documentation collection, consulting on ISO certification for aviation meteorological services, and invitational training for personnel.

○ The entire project was designed in three phases. The second phase was delivered by the WMO, and the third phase was designed to be delivered by the KMA.

○ The second phase of the project focused on installing aerodrome meteorological observation system (AMOS), establishing automatic quality control system, and dispatching experts. For the second phase, which was funded by the KMA for implementation by the WMO, the KMA sent USD 679,834.63 to the WMO Trust Fund in March 2014.

○ The KMA and the WMO jointly carried out a preliminary technical survey for the project implementation in November 2014. During the visit to Mongolia for this survey, they learned that the existing airport (project site) will be closed when a new one opens, and that the new airport will adopt the equipment which was planned to be installed at the old airport throughout the project. As a result, the WMO agreed, along with the KMA, the Mongolian National Agency for Meteorology and Environment Monitoring (NAMEM), and the Civil Aviation Authority of Mongolia (CAAM), to revise the initial project proposal. The WMO then sent a revised Project Concept Note (PCN), which focuses on the third phase of the project, to the KMA in June 2015.

○ Since then, the WMO designated the Korea Meteorological Industry Promotion Agency (KMIPA) (presently the Korea Meteorological Institute, KMI) as a project implementing agency, and signed a Letter of Agreement (LoA) with KMIPA in March 2016. The Civil Aviation Authority of Mongolia (CAAM) joined the second preliminary technical survey in May 2016 as a stakeholder, but the airport network was declared unavailable for use in July 2016. Consequently, the WMO, along with the KMA and KMIPA, visited the project site again to meet with the government of Mongolia in May 2017 regarding a security issue related to hardware (ASPS).

○ The Mongolian government suggested using the existing AviMET equipment to replace ASPS. The WMO revised the PCN and is still reviewing it as of September 2018. The WMO announced that it will launch an international public tender in December 2018 based on the revised PCN.

2. Project overview

<The previously planned second phase of the project >

		Description
Project purpose		• To assist the modernization of aviation meteorological services in Mongolia to meet international standards
Outputs		• Installing aerodrome meteorological observation system (AMOS) • Installing automatic quality control system • Dispatching experts, etc.
Target country		Mongolia
Size/Duration		USD 679,834.63
Recipient		• National Agency for Meteorology and Environment Monitoring of Mongolia (NAMEM) / Aviation Meteorological Center of Mongolia (AMC)
Project entities	Funding agency	• KMA
	Recipient	• National Agency for Meteorology and Environment Monitoring of Mongolia (NAMEM) and Aviation Meteorological Center of Mongolia (AMC)
	Supervising agency	• WMO

<Revised project based on the third phase>

		Description
Project purpose		• To strengthen aviation meteorological services in Mongolia
Outputs		• Installing aviation meteorological standard data processing system (ASPS) • Establishing an English website dedicated to aviation weather information • Installing a set of weather monitoring and briefing system • Capacity building, etc.
Target country		Mongolia
Size/Duration		USD 450,000
Recipient		NAMEM / AMC
Project entities	Funding agency	• KMA
	Recipient	• NAMEM / AMC
	Supervising agency	• WMO

3. Project process

○ The first phase of this project was conducted as part of KMA's bilateral project, but from the second phase, it was designed to be delegated to the WMO for the implementation. To this end, the International Cooperation Division of the KMA provided the WMO with funds for the second phase and its following phases of the project. However, as the project implementation with the WMO was not carried out smoothly, the KMA sent a project manager (secondee) to the WMO from November 2014 to October 2015 for a smooth implementation and management of the project.

○ The WMO, the supervising agency in this project, was responsible for selecting a project-implementing agency and delivering and managing overall activities of the project, including executing a budget and submitting an annual report to the KMA.

○ From the first phase of the project in 2013, the Aviation Meteorological Center of Mongolia (AMC), a NAMEM-affiliated agency which is in charge of the project on the recipient side, was one of the project targets that needs to be modernized through the project.

○ However, the Civil Aviation Authority of Mongolia (CAAM) had not been regarded as a stakeholder in this project until issues associated with the airport network were occurred in the project planning and implementation process, even though it is a key agency related to aviation services in Mongolia. The CAAM is included in the key stakeholders under a new PCN which is now under discussion.

4. Project timeline

- ○ 2013 KMA, as part of its bilateral project, initiated the first phase of the project of Modernization of Aviation Meteorological Services in Mongolia.
- ○ Mar. 2014 The second phase of the project was delegated to the WMO as a multi-bilateral project. The KMA provided Korea CS TF with USD 679,834.63 for the implementation of the second phase of the project.
- ○ Nov. 2014 WMO and KMA jointly conducted a preliminary technical survey and identified Mongolia's plan to close the existing airport (project site).
- ○ Jun. 2015 WMO requested KMA revise the project.
- ○ Mar. 2016 WMO designated KMIPA as a project-implementing agency, and signed a LoA with KMIPA.
- ○ May 2016 Preliminary technical survey
- ○ Jul. 2016 Using airport network was not allowed by the CAAM.
- ○ Dec. 2016 Conference call among WMO, KMA, and KMIPA
- ○ Mar. 2017 WMO, KMA, and KMIPA completed project proposals.
- ○ May 2017 Joint investigation by WMO, KMA, and KMIPA
- ○ Jun. 2017 Some activities were supplemented according to the joint investigation results (agreed by WMO, KMA, KMIPA, NAMEM/AMC, and CAAM).
- ○ Oct. 2017 WMO is having consultations with stakeholders of the Mongolian government (CAAM, NAMEM) about security equipment, and is reviewing the revised final PCN until now.

2.4.2 Evaluation Results

1. Main evaluation

○ This project has been revised since the intial project plan was developed because of issues preventing the project from moving forward. Plans and activities for the project are still under development.

○ In this regard, the evaluation team monitored and evaluated the project process on the basis of the revised PCN which is based on the initially planned project (phase 2) and the third phase of the project.

- The evaluation team evaluated the relevance and efficiency of the project process, which are two of five OECD/DAC evaluation criteria. Also, the team additionally evaluated the relation and complementation to bilateral projects, as well as the use of recipient's system, which were designed by a multi-bilateral evaluation team.

○ In accordance with the above mentioned evaluation criteria, the evaluation team developed appropriate questions for each criterion for the project evaluation.

<Table 23> Questionnaire on Modernization of Aviation Meteorological Services in Mongolia (Phase II)

Evaluation items	Sub-items	Questions
Relevance	Development strategy	Is this project consistent with the Mongolian government's development strategy?
		Is this project consistent with the Korean government's international cooperation strategy and the KMA's international cooperation strategy?
	Development needs	Is this project consistent with the needs of the Mongolian government?
		Is this project consistent with Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs)?
Efficiency	Cost efficiency	Was this project completed within the planned project duration and budget?
	Technology efficiency	Were technologies used in this project appropriate to local circumstances?
	Project implementation structure	Were the division of roles and cooperation system appropriate between stakeholders?
Relation & Complementation	Relevance of project type	Is the project is appropriate as a multi-bilateral project delivered by the WMO?
	Relation & Complementation	Is this project linked with a bilateral project of the KMA? Does this project complement a bilateral project of the KMA?
Use of recipient's system	Use of system	Did this project use the system in the recipient country?

2. Evaluation results

A. Relevance

<Table 24> Relevance evaluation results of Modernization of Aviation Meteorological Services in Mongolia

Evaluation items	Sub-items	Evaluation results
Policy and strategic relevance	Consistency with recipient country's strategy	• This project is consistent with the Mongolian government's Sustainable Development Vision 2030 and the AMC's development plan.
	Consistency with Korea's ODA policy and assistance strategy	• This project is directly and indirectly consistent with key cooperation areas of the 1st and 2nd Country Partnership Strategy of Mongolia, and also is consistent with the KMA's internal policy direction. • The first phase of the project was implemented as a bilateral project of the KMA.
	Development needs	• This project was pursued and initiated at the continued request and needs from Mongolia. • As Chinggis Khaan International Airport holds CAT I status, its environment is required to be improved.
	Consistency with MDGs & SDGs	• In terms of strengthening aviation infrastructure, the project is consistent with SDG 9 — Building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

B. Efficiency

<Table 25> Efficiency evaluation results of Modernization of Aviation Meteorological Services in Mongolia

Evaluation items	Sub-items	Evaluation results
Economic efficiency in resource use	Efficiency of input resources	• Since this project has not been implemented yet, the project budget has also not been executed, either. In the process of adjusting the first phase of the project, however, the WMO requested the KMA allocate USD 150,000 to the SWFDP in West Africa, and the KMA approved the WMO's request. • Due to changes in the project resulting from a lack of communication between stakeholders, the project is now under revision and review.
Project implement ation structure & Technical efficiency	Efficient coordination and communication between stakeholders	• The CAAM, one of the key stakeholders, was excluded from the project at first, resulting in changes to the project. • Communication within the Mongolian government (AMC and CAAM) did not go smoothly.
	Technical efficiency	• A lack of analysis of stakeholders led to an inadequate survey on the current technical state. This resulted in changes to the project.

C. Multi-bilateral evaluation

<Table 26> Multi-bilateral evaluation results of Modernization of Aviation Meteorological Services in Mongolia

Criteria	Indicators	Evaluation results
Multi-bilateral evaluation	Relevance of project type	• Considering the efficiency of the time spent in decision-making and project planning, this project was more appropriate as a bilateral project, rather than a multi-bilateral project (however, in terms of technology, the project is appropriate as either multi-bilateral or bilateral project. • For this project, however, a lack of analysis of stakeholders at the project planning stage and inadequate communication within the recipient country have become more serious issues than the relevance of the project type.
	Relation & Complementation	• A follow-up project of the initial project, which was delivered as a bilateral project, was planned to be carried out as a multi-bilateral project. But since the project has not been launched yet, it is hard to say this project has complementation to the bilateral project.
	Use of recipient's system	• Due to the inadequate analysis of stakeholders of the recipient country (CAAM), the communication system of the recipient was not utilized at all.

2.5 Severe Weather Forecasting Demonstration Project in West Africa (Phase I)

2.5.1. Project Overview

1. Project background

○ The WMO requested that the KMA transfer USD 150,000 from the Mongolian project budget to the Severe Weather Forecasting Demonstration Project (SWFDP) in West Africa. After its internal review, the KMA approved the WMO's request.

○ Noting that the WMO had successfully implemented SWFDP projects in South Africa and Eastern Africa in WMO Region Association-I (Africa), the KMA agreed with the WMO's plan to expand the SWFDP project to West Africa region. Accordingly the KMA provided funds for the initial planning and development (Phase I) of this project.

- The basic concept of the SWFDP focuses on cascading forecasting process (moving information from global, to regional to local levels), training, and activities for capacity building.

○ The SWFDP in West Africa was approved at the 17th World Meteorological Congress (Cg-17) in June 2015, at the request of the WMO Regional Association-I (Africa) in February 2015. Then, discussion over the project was first started with relevant countries and stakeholders including in Dakar, Senegal in November 2015.

2. Project overview

	Description
Beneficiary countries:	• 15 countries in West Africa: Benin, Burkina Faso, Cabo Verde, The Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Nigeria, Niger, Senegal, Sierra Leone and Togo.
Contributing Regional Centres:	• RSMC Dakar (lead regional Centre) • ACMAD, AGRHYMET, NIMET
Contributing Global Centres:	• MeteoFrance; UKMO; NCEP/NOAA; ECMWF; Environment Canada
Start of Project Planning & Development:	• In 2015
Subproject website:	• RSMC Dakar: http://www.anacim.sn/meteo/rsmc-dakar/ (Project website enhancement in progress)
Main Focus:	• Heavy rain, strong winds, high sea (swell), Max. temperature (heat waves conditions), Min. temperature (cold waves conditions)
Present Status:	• In Phase -I • Demonstration (phase-II) is likely to start in late 2018 or in early 2019
Donors:	• During 2015-2017, Korean Meteorological Administration (KMA) provided seed funding to kick start the process • Since 2018, Climate Risk & Early Warning Systems (CREWS) initiative through its project for West Africa and its in-country projects in the sub-region.

Source: WMO website (http://www.wmo.int/pages/prog/www/swfdp/SWFDP-WestAfrica.html.)
(as of October 29, 2018)

3. Project Design Matrix

A. Performance matrix

○ The Project Design Matrix (PDM) was established when this project was first designed in 2015. The evaluation team, however, additionally established the PDM for evaluation (PDMe) for the project evaluation (See Table 26).

○ According to the WMO's performance report, main objective of this project was to improve severe weather forecasting and warning services in West African countries to strengthen their capacity for responding to regional climate variability and climate change. The overall goal of the project was not specified in the report. Outputs were properly established.

- At the initial project planning stage, the objective of the PDM was to strengthen weather and climate services through the SWFDP-West Africa to contribute to the GFCS.

○ The evaluation team changed the project's objective to strengthen the capacity of severe weather forecasting and public weather services in Africa, and changed the overall goal to

improving weather forecasting and warning service in West African countries in order to strengthen their capacity of climate change response.

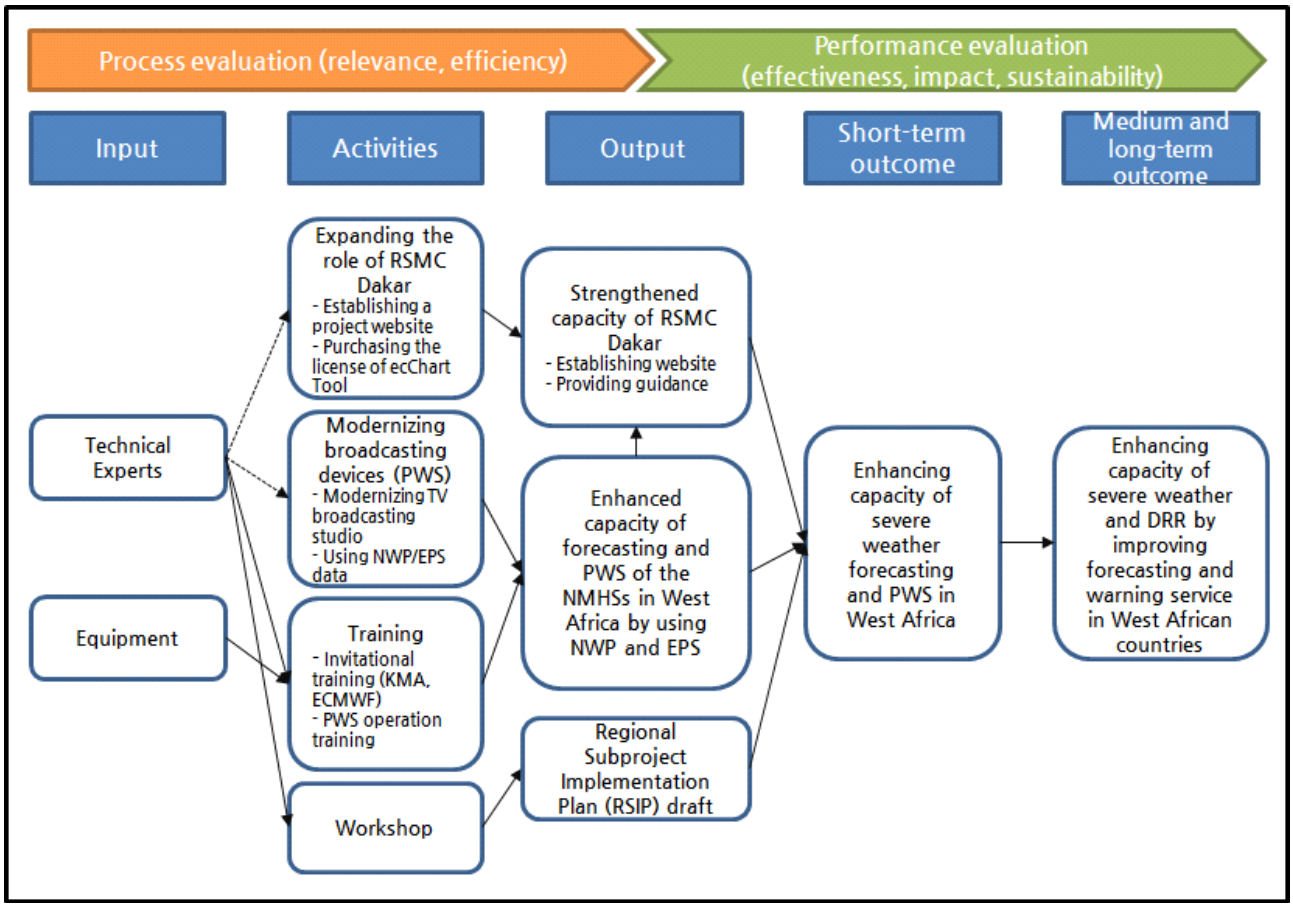
- Performance indicators were not established in the initial PDM of the WMO's project proposal and performance report. Accordingly, the evaluation team defined performance indicators as shown in Table 27.

<Table 27> Revisions in the PDM of the SWFDP-West Africa (Phase I)

Item	PDM (WMO Performance report)		PDMe (PDM for evaluation)	
	Summary	Indicator	Summary	Indicator
Overall Goal	-		To improve weather forecasting and warning service in West African countries to strengthen the capacity for responding to severe weather events and disaster risk reduction (DRR)	
Project Purpose = Outcome	To improve weather forecasting and warning service in West African countries to strengthen the capacity of climate change response	-	To strengthen severe weather forecasting and public weather service in West Africa	1-1. Forecast accuracy 1-2. Degree of meteorological information dissemination via TV and radio & Degree of an access to meteorological information by the public and disaster response agencies
Outputs	1. Expanding the role of Regional Specialized Meteorological Centre (RSMC) Dakar - Establishing a project website - Being recognized as a potential partner		1. Strengthening capabilities and expanding the role of RSMC Dakar - Establishing a project website - Providing a guidance	1-1. The number of website visits 1-2. Whether a project website is established
	2. Strengthening forecasting capabilities of West African countries by using NWP and EPS of NMHSs		2. Strengthening forecasting capabilities of West African countries by using NWP and EPS of NMHSs	2-1. Degree of West African NMHSs' awareness of the role of RSMC Dakar & Degree of satisfaction with RSMC Dakar's service 2-2. Whether NWP/EPS data is being used
	3. Establishing a RSIP		Establishing a RSIP	Whether a RSIP is published

○ The evaluation team established an evaluation frame based on the Theory of Change (ToC) to evaluate the process and outcomes of the project.

<Figure 4> ToC of the SWFDP-West Africa (Phase I)



<Table 28> PDMe for the SWFDP-West Africa

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification (MOV)	Important Assumption
Overall Goal To improve weather forecasting and warning service in West African countries to strengthen capacity for responding to severe weather events and disaster risk reduction (DRR)			
Outcomes To strengthen severe weather forecasting and public weather service in West Africa	1-1. Forecast accuracy 1-2. Degree of meteorological information dissemination via TV and radio & Degree of access to meteorological information by the public and disaster response agencies	1. Comparing forecast data with actual observations 2. Interviewing relevant people	1. Securing budget by WMO for smooth transition towards phase-II of the project
Outputs 1. Strengthening capabilities and expanding the role of RSMC Dakar - Establishing project website - Providing guidance 2. Strengthening forecasting capabilities of West African countries by using NWP and EPS of NMHSs 3. Establishing a draft regional sub-project implementation plan (RSIP)	1-1. The number of website visits 1-2. Whether a project website is established 1-3. The number of RSMC website visits 2-1. Degree of West African NMHSs' awareness of the role of RSMC Dakar & Degree of satisfaction with its service 2-2. Whether NWP/EPS data is being used 3. Whether a RSIP draft is published	1-1. Satisfaction survey data 1-2. Website visit 1-3. Website system lookup 2-1. Interviewing relevant people 3. Project report / RSIP draft	1. Active participation and attention from West African countries 2. Smooth communication among stakeholders 3. Stable Internet access by project agencies 4. Meteorological information dissemination via TV and radio & easily accessible information by the public and disaster response agencies
Activities	**Inputs**		**Pre-conditions**
1. Expanding the role of RSMC Dakar - Establishing a project website - Purchasing a ECMWF web license (ecChart Tool) **2. Modernizing broadcasting devices (PWS)** - Modernizing TV weather broadcasting studio in the NHMS of Senegal (purchasing and installing equipment and devices) - Using external data (NWP, EPS) **3. Training (invitational, on-site)** - Invited training by the KMA (one trainee from June 24 to 26, 2015 in Korea) - Invitational training by ECMWF (two trainees, from October 3 to 7, 2015 in the UK) - PWS training (11 trainees, from November 14 to 18, 2016 in Ghana, in cooperation with the Met Office) - Training in operation of modern TV weather broadcasting studio in the NHMS of Senegal - Training Workshop on Severe Weather Forecasting and Delivery of Early Warning Services in Lomé, Togo, from 20 to 30 November 2018 **4. Workshop** (18 countries, from November 2 to 6, 2015 in Senegal) - Surveying forecasting capabilities of NHMSs in West Africa - Establishing RSIP	**1. KMA: providing funding of USD 150,000** - Funding for Phase-I activities (RSIP development workshop, TV weather broadcasting studio training & equipment, WMO expert mission fees) **2. WMO: funding management & provision (CHF 78,800), project operation** - Supervision / project management - Funding for Phase-I activities (RSIP development workshop, focal point meeting, ECMWF training course) **3. Recipient countries (Phase-I: 10 countries in West Africa, including Senegal)** - Inputting human resources (participating in invited training, workshop, etc.) - Provision of project site and administrative convenience **4. Other funds:** - UK Met Office(24,300 GBP, VCP fund): Provision of TV presenters training in Ghana & Senegal - Norwegian funds(CHF 7,645): ECMWF License for eccharts tool (2 years) - CREWS(CHF 151,038): including estimated funds for Togo workshop in November 2018	1. Clear division of roles and responsibilities among stakeholders, and execution of assigned tasks 2. Inputting appropriate human resources and experts

4. Project process

○ The SWFDP was organized as a Cross Programmatic Activity within the Commission for Basic Systems (CBS), and is led by the Data Processing and Forecasting System (DPFS) Division in close collaboration with several related WMO Programmes, including Public Weather Services (PWS), Agriculture Meteorology (AgM), Marine Meteorology and Oceanography (MMO), Disaster Risk Reduction (DRR), Hydrology and Water Resources (HWR), and Tropical Cyclone Programmes.[4)]

○ The CBS carried out this project guided by its Steering Group on the SWFDP which has developed two basic documents, including SWFDP Overall Project Plan and SWFDP Guidebook for Planning Regional Subprojects.[5)]

○ All SWFDP regional subprojects are developed and implemented as per guidelines provided in these documents. The SWFDP Guidebook, especially, describes the planning process and the wide range of considerations for developing a subproject, and focuses on enabling relevant Global, Regional and National Centres to efficiently implement ‘cascading forecasting process’.

4) WMO (2017). Outcome report “*Technical Planning meeting on the Implementation of Severe Weather Forecasting Demonstration Project (SWFDP) in Western Africa”*

5) The Steering Group on the SWFDP periodically reviews and updates these two documents which were made to strengthen operational centres. It holds a meeting twice a year, and updated the documents in 2016.

5. Project timeline

- ○ Feb. 2015 WMO submitted a project proposal to the KMA on the SWFDP-West Africa.
- ○ Mar. 2015 KMA transferred funding for the SWFDP-West Africa to the WMO Climate Service Trust Fund.
- ○ May 2015 WMO discussed and gained information about the role of the NMHS of Senegal and RSMC Dakar under the SWFDP.
- ○ Jun. 2015 (WMO) One staff member of the NHMS of Senegal participated in the KMA's invitational training in data assimilation.
- ○ Oct. 2015 (WMO) two staff members from RSMC Dakar participated in the invitational training by the UK ECMWF.
- ○ Nov. 2015 WMO held a workshop on severe weather forecasting technology for West and Central Africa in Dakar, Senegal.
- ○ Jun.-Jul.2016 Purchased a license for ECMWF web products (ecChart Tool) (valid for two years, from 2016 to 2018).
- ○ Sept. 2016. WMO commenced the development of a project website in RSMC Dakar.
- ○ Nov. 2016 (WMO) 11 members from the NMHS of Ghana attended PWS training, in collaboration with the UK Met Office.
- ○ Dec. 2016 WMO modernized TV weather broadcasting studio in the NHMS of Senegal (purchasing and installing equipment and devices + operation training, from December 2016 to the fourth quarter of 2017, in collaboration with the UK Met Office, by using the voluntary cooperation programme (VCP) fund).
- ○ Mar. 2017 WMO submitted a final report to the KMA.
- ○ Sept. 2017 WMO held a technical planning meeting on the Implementation of Severe Weather Forecasting Demonstration Project (SWFDP) in Western Africa, in Abidjan, Ivory Coast.
- ○ Nov. 2018 CREWS/SWFDP-West Africa - Training Workshop on Severe Weather Forecasting and Delivery of Early Warning Services in Lomé, Togo, from 20 to 30 November 2018

2.5.2 Evaluation Results

1. Main evaluation

○ The evaluation team developed appropriate questions to each of the following criterion to evaluate the outcomes of this projects.

<Table 29> Questionnaire on the SWFDP-West Africa (PhaseI)

Criteria	Indicators	Questions
Relevance	Development strategy	Is the project consistent with the WMO's strategy and policy?
		Is this project consistent with the Korean government's development cooperation strategy for Africa and the KMA's international cooperation strategy?
	Development needs	Is this project consistent with the needs the West Africa region?
	Consistency with SDGs	Is this project consistent with SDGs?
Efficiency	Cost efficiency	Was this project completed within the planned project duration and the budget?
	Project implementation structure	Were the division of roles and cooperation system appropriate between stakeholders?
Effectiveness	Short-term effectiveness	Did this project achieve the outputs against the goal?
		Did this project improve infrastructure and operational facilities of the NMHS? (WMO KO 6.2)
	Mid- and long-term effectiveness	Did this project achieve the outcomes against the goal?
		Did this project improve the capacities of severe weather forecasting in West Africa through cooperation and partnerships with other national and regional organizations? (WMO 6.4)
		Did this project improve the delivery of PWS (public weather service and disaster information service)? (WMO KO 1.2)
		Did this project improve other stakeholders'(decision-makers, the public) awareness of key WMO and NMHS' issues and activities? (WMO KO 7.2)
Impact	Changes caused by project's impacts	Were there any social, economic, and institutional changes caused by the impacts of this project?
	Unintended impacts	What were the unintended impacts from this project?
Sustainability	Institutions & Human resources	Are there institutions and human resources capable of operating this project continuously?
	Finance	Did this project secure a budget to continuously carry out the project?
Relation & Complementation	Relevance of project type	Is this project appropriate as a multi-bilateral project delivered by the WMO?
	Relation & Complementation	Is this project linked with a bilateral project of the KMA? Does this project complement a bilateral project of the KMA?
Use of recipient's system	Use of system	Did this project use the system in the recipient country?
Others	Gender	Did women participate in the project planning and implementation process?
	Environment	Did this project consider environmental impacts in the planning and implementation process?

2. Evaluation results

A. Relevance

<Table 30> Relevance evaluation results of the SWFDP-West Africa (Phase I)

Evaluation items	Sub-items	Evaluation results
Policy and strategic relevance	Consistency with WMO's strategy	• This project was considerably consistent with seven priorities of WMO Strategic Plan for 2016-2019, especially with Capacity Development by enhancing the capacity of severe weather warning service in developing, least developed, and small island developing countries; Global Framework for Climate Services; Climate Change Adaptation by securing climate resilience; Disaster Risk Reduction (DRR).
	Consistency with KMA's assistance strategy	• This project was in line with the KMA's pursuit of using a strategic partnership with the WMO and developing and modernizing weather services in developing countries through Climate Service Trust Fund. In this regard, the project is consistent with the KMA's assistance strategy.
	Development needs	• This project was approved at the 17th World Meteorological Congress (Cg-17) in June 2015, at the request of WMO RA1 (Africa) meeting in Praia, Cabo Verde in February 2015. Accordingly, the SWFDP for West Africa started to be implemented.
	Consistency with SDGs	• This project aims at enabling Multi-Hazard Early Warning System (MHEWS) to be operated at the regional and national level, which is consistent with SDG 13.

B. Efficiency

<Table 31> Efficiency evaluation results of the SWFDP-West Africa (Phase I)

Evaluation items	Sub-items	Evaluation results
Economic efficiency of resource utilization	Efficiency of input resources	• This project was delayed as a whole compared to the initial project duration — three years from 2015-17, in three phases - With the KMA's funding, the first phase of the project (planning and development) was supposed to be initiated and completed in 2015. Due to a lack of budget and human resources, however, the project is still in the first phase (the second phase plans to be implemented in early 2019). • A significant increase in the number of recipient countries from the initial plan (from 4-6 to 15 countries) has required more budget as compared to the plan. - The KMA's funding fulfilled its role as seed funding for the project launch. - The first phase of the project will be carried out as soon as the budget is prepared by funding from different donor agencies.
Project implementation structure & Technical efficiency	Efficient coordination and communication among stakeholders	• The project implementation and management structure have been organically operated within the WMO's existing SWFDP management frame. - Roles and responsibilities are clearly documented in the Accountability Designation Form.
	Technical efficiency	• In collaboration with NMHSs in advanced countries, this project pushed ahead with establishing regional centers and capacity building for West African countries which are incapable of running NWP required for severe weather forecasting and warnings so that West African countries can use NWP data from Meteo France and ECMWF. • This project is necessary for the West African region in terms of technology.

C. Effectiveness

<Table 32> Effectiveness evaluation results of the SWFDP-West Africa (Phase I)

Evaluation items	Sub-items	Evaluation results
Outputs	Strengthening the capacity and role of RSMC Dakar	• A project website has started to be established since September 2016. The website enhancement is in progress. • A guidance on the concept and process of the SWFDP was provided. • The SWFDP was designed to target four to six West African countries, but active participation and request from several countries increased the number of recipient countries to 15 as of now.
	Strengthening the capacity of forecasting and PWS in West African countries by using NWP and EPS of NMHSs	• The initial milestone was to allow at least 25 forecasters and PWS staff members to participate in two-week SWFDP training to learn how to utilize NWP/EPS, satellite data, radar data for severe weather forecasting, but eventually 35 people joined the training. The milestone was excessively achieved. - Two-week training workshop in Togo in November 2018 is under design. It is expected to be attended by 27 operational forecasters, 18 PWS staff and 8 representatives of stakeholder organizations in addition to several other participants including researchers.
	Establishing RSIP	• A workshop was held in Dakar, November 2015 to survey forecasting capacities of NMHSs in West Africa and establish a RSIP. This workshop made the outline of a RSIP. - This led to a Technical Planning meeting in Abidjan, September 2017, setting out a RSIP 2017/2018 (version 1).
Degree of goal achievem-ent	Strengthening capacities of severe weather forecasting and public weather service (PWS) in West Africa	• If the third phase is completed, this project is expected to contribute to improving PWS (WMO KO 1.2) and capacities of severe weather forecasting in West Africa in cooperation with other national and regional organizations (WMO KO 6.4).
	Improving weather forecasting and warning service in West African countries to strengthen their response and preparedness for severe weather events	• If the third phase is completed, this project is expected to strengthen severe weather forecasting and PWS of the NMHSs in West Africa and establish information sharing and smooth cooperation system between the public and related government authorities (disaster emergency agency, etc.). This will lead to reducing loss of lives and property in case of actual emergencies and to rase awareness of disaster response.

D. Impact (outlook)

<Table 33> Impact evaluation results of the SWFDP-West Africa (Phase I)

Evaluation item	Evaluation results
Changes caused by project's impacts	• This project will minimize social, economic damage from severe weather in West Africa, thereby in the long-term, contributing to laying the foundation for the development of the West Africa region.
Unintended impacts	• This project has not had any unintended impacts, and will not in the future as well.

E. Sustainability (outlook)

<Table 34> Sustainability evaluation results of the SWFDP-West Africa (Phase I)

Evaluation items	Sub-items	Evaluation results
Possibility of project's self-sustai-nability	Policy and institutional sustainability	• As the WMO is considered to continue delivering the second and third phase after completing the first phase, the policy and institutional sustainability of this project is high.
	Administrative and financial sustainability	• In terms of human resources and structure, this project has high administrative sustainability. - It is possible to use the SWFDP's structure and manpower. Active participation is expected from the personnel of the NMHSs in West African countries. • The project has low financial sustainability. - It was identified that the project has a plan to use funding from CREWS for a budget for the second and third phase of the project. Yet, concerns were raised that funding needs to be raised continuously.
	Technical sustainability	• Technical sustainability of this project is moderate. - This project requires the Internet access to gain NWP and EPS data, as well as basic social infrastructure. Additional assistance should be given to countries with poor infrastructure.

F. Multi-bilateral evaluation

<Table 35> Multi-bilateral evaluation results of the SWFDP-West Africa (Phase I)

Evaluation item	Sub-items	Evaluation results
Multi-bilateral evaluation	Relevance of project type	• This project is appropriate as a multi-bilateral project delivered by the WMO. - It is significant that the SWFDP initiative was able to expand and launch in the West African region, with the KMA'seed funding for the first phase of the project. - However, this project needs ways to increase the visibility of the KMA's assistance by emphasizing the fact that the initiative started with the KMA's funding.
	Relation & Complementation	• It was identified that the project needs assistance for improving infrastructure (Internet, TV studio, etc.) of the NMHSs in Western African countries, which could be a potential project connecting to a bilateral project. But providing assistance through the WMO would be more appropriate, rather than through a bilateral project by the KMA.
	Use of recipient's system	• This project takes advantage of the WMO network, solidifying cooperation among all Member NMHSs. This project is considered to be very positive because the WMO uses consensus building system between Member countries, rather than system of individual countries. - The WMO incorporated comments and thoughts from participating countries into an operation manual, and actively used the manual.

G. Other criteria

<Table 36> Cross-cutting issue evaluation results of the SWFDP-West Africa (Phase I)

Evaluation item	Sub-items	Evaluation results
Cross-cutting issues	Gender mainstreaming	• There was a high proportion of women participants in a variety of workshops.
	Environmental impacts	• This project is not evaluated to have direct impacts on the environment.

2.6 Coastal Inundation Forecasting System in Fiji (Phase II-IV)

2.6.1 Project Overview

1. Project background

○ The Coastal Inundation Forecasting Demonstration (CIFDP), comprised of four phases, was launched by an initiative by the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) and Commission for Hydrology (CHy) of the WMO. Sub-projects are now underway for countries meeting main requirements.

○ The CIFDP-F is a sub-project of the CIFDP for Fiji. The first of this project was delivered from November 2012 to October 2013, with USD 200,000 of funding from the Korea International Cooperation Agency (KOICA).

○ Changes in the domestic and global landscape made it difficult for KOICA to provide funding for a follow-up project. Consequently the project was suspended from 2014 to 2015. The WMO and Fiji Meteorological Service (FMS) consistently requested for the KMA's funding. The KMA agreed to provide assistance for the project from the second to the fourth phase through the Trust Fund.

- For the second to fourth phase of the CIFDP-F, the KMA provided USD 400,000 every year for three years, from 2016 to 2018.

○ The KMA sent USD 400,000 to the WMO by the way of the Trust Fund for the CIFDP-F in July 2016. The discussion on the project was resumed at the CIFDP-F meeting in Fiji in August 2018.

- The Secretariat of the Pacific Community (SPC) was designated as a project implementing partner, which has been delivering various projects to South Pacific island states. The SPC is implementing the project since it signed a Letter of Agreement (LoA) with the WMO in February 2017.

2. Project overview

		Descriptions
Goals	Overall goal	• To implement coastal inundation forecasting and warning system in South Pacific island countries to improve the capacity for disaster response
	Mid-term goal	• Continued operation of coastal inundation forecasting and warning system to strengthen the capacities of severe weather monitoring and forecasting & warning
	Short-term goal (outputs)	• Installed coastal inundation forecasting and warning system (wave, storm surge, hydrological flooding, coasting inundation model) • Installed equipment (wave buoy, ICT equipment) • Capacity building • Cooperation platform
Roles	KMA	• Funding
	WMO	• Supervising the overall project
	SPC	• Developing and implementing models • Installing system and equipment • Dispatching experts • Education and training
	Recipient (FMS)	• Providing support for the project
Project location		Fiji
Scale/Duration		USD 1,200,000 (400,000 dollars for each phase)
Beneficiary		FMS, the general public in Fiji, coastal residents, small island countries near Fiji
Project entities	Funding agency	• KMA
	Recipient	• Fiji Meteorological Service (FMS)
	Supervising agency	• WMO
	Implementing agency	• Secretariat of the Pacific Community (SPC)

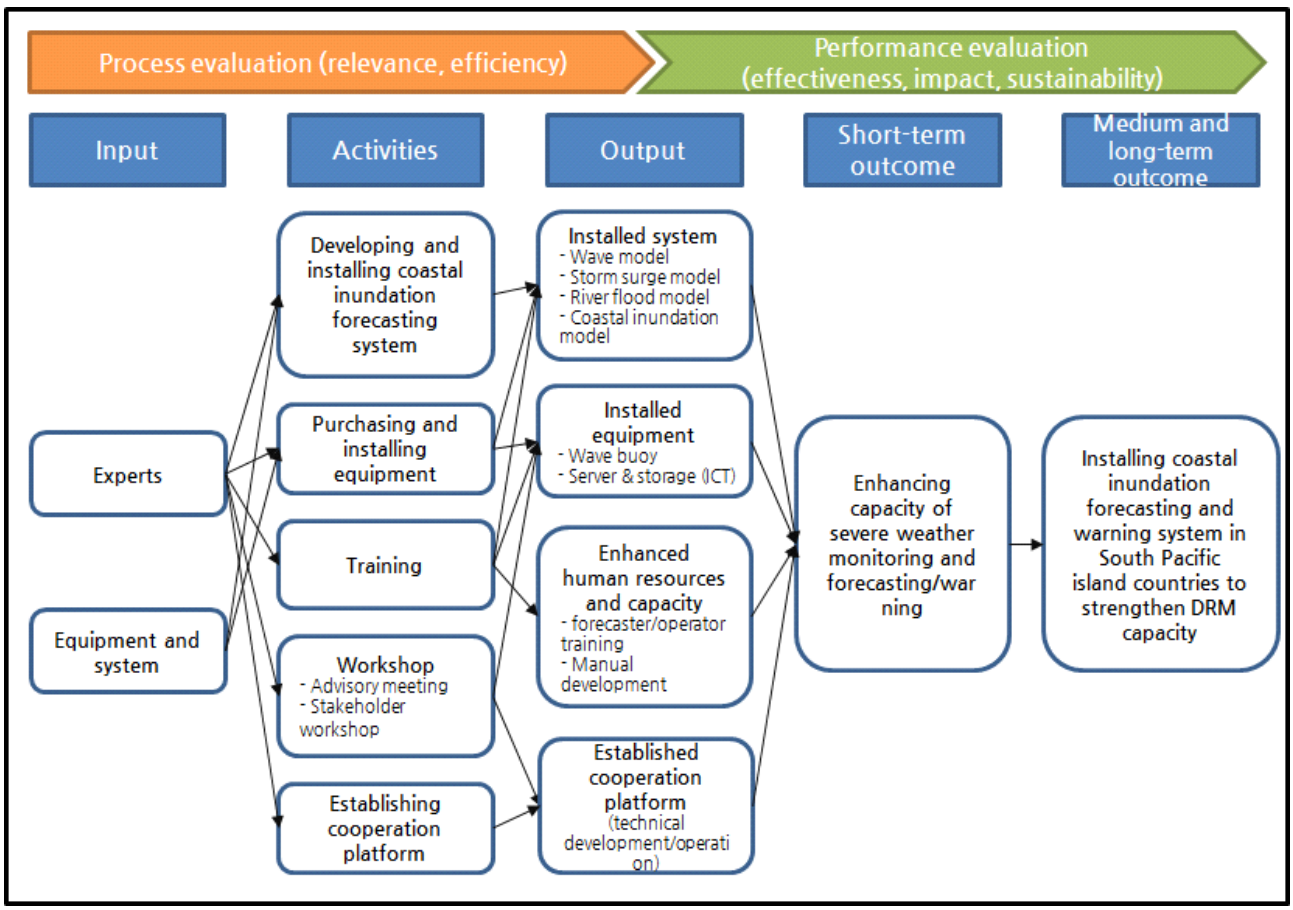
3. Project Design Matrix

A. Performance matrix

○ The Project Design Matrix (PDM) was not established when this project was designed. The evaluation team, however, established the PDM for evaluation (PDMe) for project evaluation.

○ In addition, the evaluation team established an evaluation frame based on the Theory of Change (ToC) to evaluate the process and outcomes of the project.

<Figure 5> ToC of the CIFDP-F (Phase II-IV)



<Table 37> PDMe for the CIFDP-F

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification (MOV)	Important Assumption
Overall Goal			
To establish coastal inundation forecasting and warning system in South Pacific island countries to strengthen DRM capacity			
Outcomes			
Continued operation of coastal inundation forecasting and warning system to enhance the capacity of severe weather monitoring and forecasting & warning	1. Forecast accuracy	1. Comparing forecast data with actual observations	1. Establishing operation system and securing operational budget 2. Systematic cooperation with relevant agencies
Outputs			
1. Installed coastal inundation forecasting and warning system - Wave, storm surge, river flood, coastal inundation model 2. Installed equipment - Marine observation instruments (wave buoy) - Server and storage 3. Capacity building - Forecaster training/manuals - Operation and maintenance 4. Established cooperation platform (technical development and operation)	1. Whether the recipient can operate the system 2. Whether equipment are purchased and installed 3. The number of trainees - Capability self-assessment 4. Whether information dissemination system is established between relevant agencies	1-1. Project report/Pilot-operation report 1-2. Interviewing personnel in charge 2-1. Project report 2-2. On-site inspection 3-1. List of training participants 3-2. Manuals 4. Interview	1. Systematic/continued on-site training 2. Securing capability for system operation 3. Installing system suitable to the recipient's circumstances and appropriate maintenance
Activities	**Inputs**		**Pre-conditions**
1. Developing and installing coastal inundation forecasting and warning system (2nd-4th year) - Pre-operation test - Developing and integrating components of models 2. Purchasing and installing equipment (Phase II-III) - Marine observation instruments - ICT system, including server 3. Training (Phase II-IV) - Forecaster training - Developing manuals 4. Workshop (Phase II-IV) - Advisory meeting - Stakeholder workshop 5. Establishing cooperation platform (PhaseIV) - Establishing cooperation platform for technology development and operation	1. KMA: Provides funding of USD 1.2 million in total - 400,000 dollars for each phase - Cooperation with WMO, advising on marine meteorology and hydro-meteorology 2. WMO: Supervising agency - Supervising the overall project 3. SPC: Implementing agency (USD 3.13 million) - Developing and installing integrated coastal inundation forecasting and warning system - Provide training and technical support 4. FMS: Recipient - Providing personnel for system installation and administrative support - Provision of installation site for research and forecasting system - Customs clearance and transport of provided equipment		1. Selection of an eligible implementing agency as well as securing experts 2. Close communication between stakeholders and executing their own roles and responsibilities

4. Project process

○ The International Cooperation Division of the KMA provided funding for this project, and ensured and managed the progress of the project through an annual project report, without direct involvement of its personnel. The Marine Meteorology Division offered technical support and advice with respect to models and observations of wave, storm surge, inundation.

○ The WMO, the supervising agency in this project, was responsible for selecting an implementing agency and supervising and carrying out the overall project, including executing a budget and submitting an annual report to the KMA. The Marine Meteorology and Ocean Affairs Division of the WMO was the main division involved in the project.

○ Every CIFDP project is basically implemented in accordance with the CIFDP Implementation Plan.

○ Stakeholders' Workshop for the CIFDP-F was held in February 2013 during the first phase of the project. At the Workshop, the National Coordination Team (NCT) of the CIFDP-F developed a Terms of Reference (ToR), as well as Definitive National Agreement (DNA). The Fiji's cabinet then officially approved the DNA.

○ In addition, this project has a Project Steering Group (PSG) comprised of experts in meteorology, oceanography, hydrological modelling, and service and social scientists. In close cooperation with the NCT, the PSG established a User Requirements Plan (URP) and National Capacity Assessment (NAC). Based on this plan and assessment, technologies are now under development throughout the second to the fourth phase of the project.

○ The Secretariat of the Pacific Community (SPC), the project implementation partner (PIP) in this project, concluded a LoA with the WMO, and has been carrying out its tasks including model development, regular reporting, and forecast capacity enhancement.

○ The FMS is responsible for managing and supervising the project on the recipient side. Technology development and other activities related to the project are mostly carried out at the headquarters of the FMS in Nadi.

5. Project timeline

- ○ Nov. 2012 Launched the first phase of the CIFDP-F (funded by KOICA and delivered by the WMO).
- ○ Oct. 2013 Completed the first phase of the CIFDP-F
- ○ May 2016 Initiated the second phase of the CIFDP-F
- ○ Jul. 2016 KMA provided USD 0.4 million to the Korea CS TF for the second phase of the CIFDP-F.
- ○ Aug. 2016 Held a Review Meeting and Kick-Off meeting
- ○ Feb. 2017 The 7th PSG meeting in Geneva, Switzerland
- ○ Feb. 2017 Concluded a LoA with the SPC for a project implementation partner (USD 313,000, from April 2017 to April 2018)
- ○ Apr. 2017 The project budget was transferred from the WMO to the SPC.
- ○ Jul. 2017 Stakeholders' Workshop for supporting the SPC organized by the WMO in Nadi, Fiji.
- ○ Dec. 2017 KMA provided USD 0.4 million to the Korea CS TF for the third phase of the CIFDP-F
- ○ — present The project is now underway. Different phases of each project area, from the second to the fourth, are being simultaneously implemented.

2.6.2 Evaluation Results

1. Main evaluation

○ Since this project is still underway, the evaluation team developed the following evaluation criteria and questions to evaluate the project at the monitoring level.

<Table 38> Questionnaire on the CIFDP-F (Phase II-IV)

Criteria	Indicators	Questions
Relevance	Development strategy	Is this project consistent with the Fiji government's development strategy and policy?
		Is this project consistent with the Korean government's international cooperation strategy and the KMA's international cooperation strategy?
	Development needs	Is this project consistent with the needs of the Fiji government?
		Is the objectives of this project consistent with MDGs and SDGs?
Efficiency	Cost efficiency	Was this project completed within the planned project duration and budget?
	Technical efficiency	Were technologies used in this project appropriate to local circumstances?
	Project implementation structure	Were the division of roles and cooperation system appropriate between stakeholders?
Relation & Compleme-ntation	Relevance of project type	Is this project appropriate as a multi-bilateral project delivered the WMO?
	Relation & Complementation	Is this project linked with a bilateral project of the KMA? Does this project complement a bilateral project of the KMA?
Use of recipient's system	Use of system	Did this project use the system of the recipient country?

2. Evaluation results

A. Relevance

<Table 39> Relevance evaluation results of the CIFDP-F (Phase II-IV)

Evaluation items	Sub-items	Evaluation results
Policy and strategic relevance	Consistency with recipient country's strategy	• This project is consistent with the Fiji government's policies such as "5-Year & 20-Year National Development Plan, Transforming Fiji" and national climate change policy.
	Consistency with Korea's ODA strategy and assistance strategy	• Fiji is a focus country for the Korean government to coordinate and supervise cooperative activities with Pacific island countries. The government's main goal is a cooperation on climate change response. • This project is also consistent with the KMA's internal policy direction.
	Development needs	• Fiji is vulnerable to natural disasters. Its coastal areas often suffer from consequent damage. • Fiji has a high need for enhancing capabilities of climate change response and natural disaster response.
	Consistency with MDGs/SDGs	• This project is consistent with SDGs in the context of climate change and response to climate change impacts

B. Efficiency

<Table 40> Efficiency evaluation results of the CIFDP-F (Phase II-IV)

Evaluation items	Sub-items	Evaluation results
Economic efficiency of resource use	Efficiency of input resources	• This project is being implemented within the planned budget. • As the project was delayed by 11 months from the initial plan, it is impossible to complete the project within the planned duration (aiming to complete by late 2019).
Project implemen-tation structure & Technical efficiency	Efficient coordination and communication between stakeholders	• Cooperation system is well established among project agencies and stakeholders. • Participation from several stakeholders in the project makes it difficult to manage the project. In particular, inefficient communication and decision-making system in the Fiji government undermine the efficiency.
	Technical efficiency	• According to the results of preliminary technical survey and the first phase, the project uses technology suitable to local circumstances.

C. Multi-bilateral evaluation

<Table 41> Multi-bilateral evaluation results of the CIFDP-F (Phase II-IV)

Evaluation items	Sub-items	Evaluation results
Multi-bilateral evaluation	Relevance of project type	• The project is very appropriate as a multi-bilateral project in connection with the fact that it participates in a global initiative.
	Relation & Complementation	• Providing assistance as a bilateral project can be considered with respect to newly identified potential project opportunities or additional requirements from Fiji
	Use of recipient's system	• This project has been implemented as a multi-bilateral project. It is positive that the recipient's system was used and a sense of ownership was expressed during the implementation process

3 Evaluation and Analysis

3.1 Evaluation Summary

3.1.1 Summary of Performance Evaluation

	Laos	Uzbekistan	West Africa
Summary	This project — the COMS data receiving system delivered by the WMO — was successfully implemented. But due to the small capacity for operating and using the system, the project has low technical sustainability. It is evaluated that a follow-up project is necessary to assist the data receiving system with a launch of the COMS's follow-up satellite.	The Uzbekistan Climate Data Rescue Project delivered by the WMO was successfully implemented, and the installed system has been in operation so far. The project achieved outputs and goals as planned in general. The amount of climate data is expected to increase more through a follow-up project (data digitization). In this sense, the project in general is evaluated to be successful.	This project was launched by the WMO's decision to expand the SWFDP to the West African region to meet the region's needs. The relevance of the project is high, whereas the efficiency is low. The project achieved the effectiveness (outputs) as planned. As for now, since only the first phase of the project was completed, this evaluation has limitations to evaluate the project's impacts and whether the short-and mid-term goals were achieved. The project has sustainability in terms of policy and human resources, but more efforts are needed in terms of the sustainability of budget and technology.
Relevance	This project is consistent with the recipient country's policy and strategy. Also, the recipient was also in strong needs of forecasting and warning system for responding to flooding and other severe weather events. In this regard, this project is high on the list of priorities of the recipient.	This project is consistent with the recipient country's policy and strategy. The recipient is in strong needs of rescuing important climate data. In this regard, this project is high on the list of priorities of the recipient. - However, the project planning was slightly inadequate to consider more	This project is consistent with the WMO's policy and strategy. The project was launched because of high needs from West African countries. - The PDM was designed at the planning stage. However, more factors, such as project objectives, performance indicators, were not fully

	- However, the project planning was slightly inadequate to consider more factors, such as project objectives, performance indicators, technical specifications considering the local situation, etc.	factors, such as project objectives, performance indicators, goal achievement, etc.	considered at the planning stage.
Efficiency	The project duration was not specified in the contract between the WMO and the implementing agency. Consequently, there are limitations to evaluate whether the project was implemented within the planned duration. - It took a total of 30 months to complete the project since the project budget was provided. - The project was completed within the budget. - Expenses for dispatching a KMA employee to ensure smooth implementation of the project were allocated to the WMO's project management.	At the initial planning stage, the project was designed to implement in three phases for 20 months. - The completion was delayed (extended) by 19 months from the original duration of 20 months. - There was no additional increase in the project budget.	At the initial planning stage, this project was designed to implement in three phases for three years. - The first phase was initiated in 2015, and has been still underway. - The second phase is expected to begin in 2019. - The KMA's funding of USD 150,000 was spent for activities to kick off the project. - In addition to the KMA's funding, funding from different sources, such as CREWS and the UK, has been provided to carry out the project.
Effectiveness	Some outputs of this project correspond to the expected outputs. - The COMS data receiving system was actively used since its installation in April 2015. But it was not used for about six months (February to August 2018) due to issues in the system. - Training for enhancing the capacity for operating the COMS data receiving system	This project achieved its output goal — rescuing 17 million pages of climate data - Digitization of the data was not implemented due to a lack of budget. - Seven million pages of climate data, which was required by Uzhydromet, were restored (permanently preserved). - This project increased users' access to the data. In this sense, this project was	This project achieved some of its output goals as planned. - The project partially contributed to strengthening the capacity of RSMC Dakar and expanding its role. - The project partially contributed to enhancing the capacity of the NHMSs in West Africa in terms of forecasting using NWP and EPS data, and PWS. - A draft of RSIP was

	was delivered. However, the training period was short, and training for users (forecasters, satellite data analysts) were not adequate. Consequently, the training did not significantly contribute to their capacity building. - While the system was in operation, it partially contributed to enhancing the capacity of severe weather monitoring, which is the project's objective. - If the system is continuously used, the objective and long-term goal of the project — enhancing the capacity of disaster response management — are expected to be achieved.	partially successful. - This project is expected to achieve its objective after a following-up project (data digitization) is completed because research using the climate data and capacity of climate change response will be increased.	established. As for now, however, there are limitations to evaluate the objectives and goals. The project is expected to contribute to achieving the objectives and goals after the third phase is completed.
Impact	At this moment, it is difficult to verify impacts caused by the project. However, if the system is used continuously, it will increase the public's credibility and awareness of forecasting and warning and establish smooth cooperation system among related government agencies, resulting in a decrease in damage from disasters. In the long-term, it is expected to have positive impacts on building a stable foundation for the national development of Lao PDR.	This project had a positive impact on job creation by hiring 15 local people. It will contribute to providing long-term forecasting service using digital data, enhancing the capacity of severe weather response, and allowing different sectors of the society to use climate data. Consequently, in the long-term, this project is expected to have a impact on building a foundation for the national economic development of Uzbekistan.	As for now, impacts by this project cannot be verified. However, the project is expected to have a positive impact after the third phase is completed.
Sustaina -bility	This project has high policy and institutional sustainability, whereas it has relatively low sustainability in terms of	The recipient's efforts to increase the sustainability of this project was noticeable,	The sustainability of this project is high in terms of policy and institutions, as well as human resources and

	human resources, budget, and technology.	such as hiring three people as a regular worker, securing a budget, and forming a new division resulting from the organizational restructuring.	organization. However, for financial sustainability, raising and securing funds continuously is critical.
Multi-bilateral evaluation	Assistance needs to be given as soon as possible around at the time of launch of the GK-2A satellite. Considering the efficiency of the project, a follow-up project can be led to and complement a bilateral project.	By taking advantage of the WMO, this project was able to use expertise from agencies and related fields. Also, it contributed to boosting the profile of both Uzhydromet and the KMA.	In line with the WMO's SWFDP initiative, this project is appropriate as a multi-bilateral project. The project can be connected to and supplement a bilateral project. But it is not consistent with the KMA's strategic priority because of geographical issue, etc.
Cross-cutting issues	(Gender mainstreaming) There is a high proportion of women in the COMS system users. But it seems that gender mainstreaming was not considered in the planning and implementation process. (Environment) There were no particular issues.	(Gender mainstreaming) As this project highly took advantage of female human resources when hiring local people, it contributed to gender equality. (Environment) This project reduced paper use, contributing to the environmental protection.	(Gender mainstreaming) Women's participation was high in various workshops. (Environment) There were no particular issues.

3.1.2 Summary of Process Evaluation

	Mongolia	Fiji
Summary	Considering the poor working environment in aviation meteorological services in Mongolia and the country's growing needs for aircraft, this project has high relevance. However, the technical state of the recipient was not adequately surveyed and reviewed because of insufficient information sharing within the recipient and a lack of analysis of stakeholders. This resulted in changes in the project plan. In this sense, the project has very low efficiency.	The CIFDP-F delivered by the WMO has been successfully implemented so far. There were some delays in implementation due to some issues related to the budget. However, cooperation system was well established among stakeholders, and the local situation was well considered in the planning. Also, it is evaluated that the project is appropriate as a multi-bilateral project that can take advantage of the WMO's strengths.
Relevance	This project is consistent with the policy and strategy of the recipient, the Korean government, and the KMA, as well as MDGs or SDGs. But since the CAAM, the key stakeholder in the project, was excluded in the project at first due to a lack of communication within the recipient country, the project had insufficient understanding of the overall needs, priorities, and the current state of the recipient.	This project is consistent with the recipient country's policy and strategy. In particular, since the country is very vulnerable to climate-induced coastal inundation and other natural disasters, there was a high need for the project. The project was well designed based on the separately implemented first phase of the project.
Efficiency	This project has not been implemented so far since the project budget was provided. Revising the project activities took long a long time due to administrative procedures. - The budget execution rate against the planned budget is low, and the size of the budget was also reduced. When the project was designed and launched, analysis of stakeholders of the recipient country was inadequate and on-site technical survey was also inadequate due to a lack of professionalism in the field of aviation meteorological service.	Even though the initiation of the second phase of the project was delayed by 11 months from the original plan, risks and issues related to the project schedule have been managed. Inefficient decision-making system of the Fiji government was identified as one of the biggest risks. - The project budget has been executed well so far without particular changes or issues. Stakeholders have smooth communication each other. Workshops are regularly held, and technology and the number of human resources were properly selected and determined at the planning stage.
Multi-bilateral evaluation	This project is appropriate as both a multi-bilateral and bilateral project. But it was not able to take advantage of the WMO's strengths and has low efficiency in terms of the project duration. In this sense, it is evaluated that this project would have been more appropriate as a bilateral project.	Since this project was able to take advantage of the WMO's strengths and its initiative, it is appropriate as a multi-bilateral project. It is also expected to contribute to improving the profile and influence of the KMA in the WMO community.

3.2 Fact-findings and Lessons learned

3.2.1 Lao PDR

1. Fact-Findings

○ Fact-findings of this project are as follows:

Planning	**Identifying needs**	• Developing a project on the basis of the PCN suggested by the KMA. - The KMA's project feasibility study was conducted on other Southeast Asian countries, not on Lao PDR.
	Project planning	• Users (forecasters, satellite data analysts) were not adequately considered in terms of capacity building. - Training for forecasters and satellite data analysts was not organized. (But later, this was partially supplemented through invitational training by the KMA.) • Lack of consideration of local circumstances - Lack of IT specialists, subtropical climate, and environmental characteristics
Implementation	**Contract**	• (Duration) It took nine months to launch a public tender and select an implementing agency - 2012: Establishing the PCN, providing the project budget → Mar. 2013: On-site technical survey jointly by the KMA and the WMO → Sept. 2013: Reviewing technical specifications by the WMO → Oct. 2013: International public tender → Jun. 2014: Contracting with the EEC → Apr. 2015: Completion of the project
	Project implementation	• (Input) Human resources inputted in the project have expertise in the field of satellite. Equipment used in the project met the requirements for the outputs • (Activity) Activities for capacity building were insufficient. - There was a lack of time for training (three days), training content, and IT human resources. Even though a manual was provided, it was not easy to use because it was written in English. - Satellite data were not fully used because of the absence of training for users (forecasters, satellite data analysis) -> Invitational training by the KMA for the COMS data users, which was separate training from the project, supplemented the lack of training.
Evaluation	**Evaluation and feedback**	• After the project was completed, the KMA staff member dispatched to the WMO conducted an interview with participants in the SAT and training, and then they made a mission report.
Post completion follow-up	**Follow-up measures**	• (Sustainability) This project has low sustainability, weakening the efficiency of the project. - Due to a lack of maintenance capacity and willingness, the system was not used for about six months (problems with display panel and power batteries) - Low utilization of the satellite data due to the lack of forecasters' capacity: lack of basic knowledge of meteorological satellite, incomplete understanding of how to use the satellite system • (Follow-up project) This project identified a need for a follow-up project in line with the upcoming launch of the KMA's GK-2A satellite.

2. Lessons learned and recommendations for efficiency of similar projects

○ Technical sustainability needs to be secured for the effectiveness and the impact of the project.

- The system was not used for about six months because of problems with display panel and power batteries

○ At the planning stage:

1) Emphasis should be placed more on capacity building when designing any similar projects.

- Including training for users (forecasters) for improving the efficiency (e.g. long-term dispatch of experts, etc.)
- Providing training for basic meteorological theories, especially satellite data application, and how to use forecasting tools
- Enhancing training for system operators, such as by providing a manual in local language, help desk, online support, etc
- Including training for the DMH staff and IT training

2) Capabilities for utilizing satellite data should be enhanced by obtaining technical advice from meteorological (satellite) experts.

○ The KMA needs to differentiate the way it provides assistance for satellite related projects

- As the KMA's assistance for satellite-related projects overlap with that of China and Japan, Korea needs to take advantage of its strengths. (e.g. connecting satellite and typhoon project, such as Typhoon Operation System (TOS), including capacity building of users as a mandatory activity)

○ Requirements for recipient countries:

- Developing meteorological professionals such as forecasters and analysts in a variety of fields, including satellite and radar
- Making efforts to secure human resources and budget for system operation and its maintenance
- Expanding a role of the NMHS in the recipient country as a key agency in disaster risk management, and continuously enhancing the capacity of PWS

3. Post-management and follow-up measures

○ It is necessary to normally operate the COMS data receiving system and upgrade the system in line with a launch of the follow-up satellite. The KMA needs to carry out a bilateral project with respect to satellite data receiving (analysis) system for the recipient country in line with the launch of the KMA's GK-2A satellite.

3.2.2 Uzbekistan

1. Fact-Findings

○ Fact-findings of this project are as follows:

Planning	**Identifying needs**	• This project was developed on the basis of the PCN suggested by the KMA. - The KMA sent the results of its project feasibility study.
	Project planning	• There was a lack of cooperation with the recipient in the process of setting output objectives. - KMA's feasibility study: 370,000 pages of records IEDRO: approx. 17 million pages of records - Current estimates by the Uzhydromet: approx. 12 million pages • The planning stage did not sufficiently conduct a on-site survey and had insufficient understanding of the current state of work and services. - There was a lack of understanding of National Data Protection Policy of Uzbekistan. - Disassembling and reassembling the data was not considered. - Integration with the software used by Uzhydromet was not considered. - There was a lack of surveying on technical specifications in detail, such as camera specifications, storage volume, size of book stand, etc.
Implementation	**Contract**	• The project contracted with the IEDRO for an implementing agency, which is an international non-governmental organization with expertise in climate data rescue.
	Project implementation	• (Input) This project has high needs from the recipient, big enthusiasm from project-involved staff, and high professionalism of the IEDRO's experts. - The project hired 15 local people. After the project, three of them were hired by Uzhydromet as a regular worker. The remaining 12 people showed great interest and willingness for the participation in the follow-up project. • (Duration) Factors delayed the project - Delay in transporting equipment and instruments (The DHL lost documents) - Difficulties in customs clearance - Delay in initiating the project, due to a delay in providing the project budget (delayed from Feb. 2015 to May 2015) - Changes in personnel at each involved-agency resulted in delays in the project • (Budget) The digitization of the data was determined to be delivered in the follow-up project. - As it needs to consider National Data Protection Policy of Uzbekistan and integration with Uzhydromet's existing software, it is impossible to introduce the existing cloud-based system. - Additional budget should be secured for the system installation. - The existing budget for the data digitization can be used for continued operation of the project (labor costs for local personnel). • Absence of IT professionals in Uzhydromet made it difficult to operate the system and conduct troubleshooting (Since the implementing agency is in the US, it is hard to take immediate actions to address issues).
Evaluation	**Evaluation and feedback**	• The KMA member dispatched to the WMO and related people from other donor countries held a project completion ceremony and made a mission report.
Post completion follow-up	**Follow-up measures**	• (Sustainability) A new division will be created in relation to climate data rescue through organizational restructuring. - This will allow continued system operation, including equipment maintenance. • (Follow-up project) Need for a data digitization project - A project for digitalizing the data is necessary for the efficiency and the impact of the project. • (Scale-up) High demand for climate data rescue - With a successful implementation of this project, the project can be expanded to neighboring countries.

2. Lessons learned and recommendations for efficiency of similar projects

○ Digitalization of the data is essential to improve the efficiency of this project. After a follow-up project, it is expected to achieve the expected outcome - enhancing capacity for climate change response with climate data.

○ Planning stage: Comments from the recipient should be reflected when setting outputs and objectives of the project.

- During a preliminary feasibility study, adequate communication with the recipient country is necessary with respect to necessary equipment, facilities, and technology. Some technical parts such as dissembling and reassembling the climate data were not considered.
- Considering administrative and approving procedures in the recipient's government, at least more than six months of period should be given to the recipient for project preparation.

○ Risk and issue management: It needs to come up with measures to prevent the project from being delayed between planning and implementation stage. The project budget should be provided on time as planned. The planning also has to allocate enough time for equipment transportation and customs clearance.

○ Follow-up project: The second phase of the project needs to be implemented quickly. Also, it needs to take advantage of the local people who participated in the first phase in order to increase the efficiency and effectiveness of the project.

3. Post-management and follow-up measures

○ Importance of follow-project: Through the first phase of the project, the rescued climate data were converted to image files. The image files can help research, analysis, and decision-making, but the data cannot be fully utilized because they were not digitalized. Users' access to climate data has improved, but the data still have not been fully utilized. The climate data should be converted to digital format through a follow-up project so that the utilization of the data can be increased, and thereby the project can see a long-term effectiveness. When designing a follow-up project, it is necessary to conduct a more detailed technical survey on a scope of project tasks (e.g. the amount of data to be digitalized) and to have discussion among stakeholders.

3.2.3 Mongolia

1. Fact-Findings

○ Fact-findings of this project are as follows:

Project planning	**Identifying needs**	• The first phase of the project was implement as a KMA's bilateral project. - From the second phase, it was commissioned to the WMO (The KMA delivered the PCN).
	Planning	• (Analysis of stakeholders) The CAAM, the key stakeholder, was excluded from the project at first. - The implementation of the project was undermined as an old airport in the recipient country was closed down and information was not sufficiently shared between stakeholders of the NAMEM, such as the CAAM. - The CAAM did not allow the installation of ASPS equipment, which is part of the project tasks. It took more time to receive a permission to use AviMET, inevitably resulting in a delay in implementation.
Implementation	**Contract**	• The WMO concluded a private contract with the KMIPA.
	Project implementation	• (Input) An expert from the KMA was dispatched to the WMO to manage the aviation meteorological service project in Mongolia, as well as the other projects supported by the KMA. - The expert was dispatched as a project manager for the efficient implementation of projects. However, due to changes in the PCN for the Mongolian project, the manager was not able to directly engage with the project implementation. • (Communication) Lack of communication within the Mongolian government (between AMC and CAAM) - Information was not sufficiently shared among main stakeholders of the Mongolian government - The CAAM, which is an upper-level of agency, was not aware of the project at all. • (Efficiency) Due to changes in the project, the project implementation has been delayed to date. - The main reason for the delay is confusion on the recipient side and delays in the WMO's internal review process. - Initial project: Installing AMOS in the old airport - Changed project: Improving the website, capacity building, etc. • (Budget) With the changes in the project, a reduction in the size of the project was expected. At request of the WMO, USD 150,000 were allocated to the SWFDP in West Africa.
Evaluation	**Evaluation and feedback**	• N/A
Post completion follow-up	**Follow-up measures**	• N/A

2. Lessons learned and recommendations for efficiency of similar projects

○ Analysis of stakeholders: A survey and analysis of stakeholders and consultations should be thoroughly conducted at the planning stage.

- The project‘s content had to be revised because of a lack of information-sharing between stakeholders in the recipient country. A delay in the WMO‘s reviewing also resulted in a delay in the project implementation.

3. Post-management and follow-up measures

○ Selecting and implementing project activities: Currently, the WMO is revising and reviewing the PCN. The WMO needs to expedite its administrative process to confirm the project content and kick off the project as soon as possible. Also, at the planning stage of a new project, stakeholders including the CAAM have to have close communication to design feasible project activities.

3.2.4 West Africa

1. Fact-Findings

○ Fact-findings of this project are as follows:

Project planning	**Identifying needs**	• This project was developed by the WMO's SWFDP initiative - At the request of RA-I (Africa)
	Planning	• This project was planned and launched based on the SWFDP framework - The project was initially planned for four to six countries, but currently it has expanded to 15 countries. - This project has flexibility in planning the project duration and budget because the project does not focuses on adopting a certain system, but on building a regional consensus, as well as establishing a cooperation system between developed countries and the recipient region to allow a regional center to fulfill its role in the region.
Implementation	**Contract**	• This project was launched directly by the SWFDP-related division of the WMO as part of the WMO's initiative. - The project was launched and implemented based on the project operation system developed by the SWFDP's framework
	Project implementation	• (Budget) Difficulties with raising funds was one of the biggest issues and risks that caused a delay in implementation. - The SWFDP in West Africa was possible to launch with the initial seed funding from the KMA. - The first phase has been implemented with funds from different sources including KMA, CREWS, Norway, and the UK. - As the second and third phase are in line with the CREWS'financial management plan, they are expected to launch with the CREWS' funds. • (Communication) There has been a lack of communication and information-sharing between WMO and KMA. - It was difficult for the KMA to identify the overall progress and activities of the SWFDP-West Africa. The KMA judged that it is hard to secure its visibility. - Since the WMO reported the KMA only about the KMA's contributions, only limited information was shared between the two sides. But the KMA has been making efforts to secure and increase the visibility of its assistance for the project. • (Input) Under the WMO initiative, it is possible to cooperate with various different countries. - KMA + UK + Norway + WMO's implementation structure + NMHSs in West Africa
Evaluation	**Evaluation and feedback**	• The logframe designed for the project has been used for evaluation.
Post completion follow-up	**Follow-up measures**	• Two-week training program is slated to be launched in Togo in November 2018. During the same period, the project aims to complete its first phase and achieve a consensus within the region in which the second phase will be launched.

2. Lessons learned and recommendations for efficiency of similar projects

○ Global initiative: The SWFDP-West Africa was launched to expand the SWFDP, the WMO's global initiative, to other regions. This project focused on enhancing and expanding the role of RSMC Dakar, and improving forecasting and warning services and PWS of NMHSs in West Africa. When launching similar projects in the future, the KMA needs to provide not only funding, but also human resources who can offer technical advice at the planning stage so that the project can contribute to strengthening the capacity of developing countries in general. In doing so, it also needs to secure visibility of the project.

3. Post-management and follow-up measures

○ The second and third phase of the project: The WMO has to efficiently implement the SWFDP in West Africa based on the project proposal and guidance, just as it successfully delivered the SWFDP in other regions. The KMA can consider how to secure the visibility, as well as the impact of the project by providing additional assistance.

3.2.5 Fiji

1. Fact-Findings

○ Fact-findings of this project are as follows:

Planning	**Identifying needs**	• This project was developed by the WMO's CIFDP initiative. - The first phase was implemented with KOICA's funding in 2013. - The second to fourth phase were implemented with the KMA's funding.
	Project planning	• This project was designed and launched based on the CIFDP framework. - Activities for the project was determined through a on-site technical survey and consultations with experts.
Implementation	**Contract**	• This project contracted with the SPC for model development. • It recently contract with the NIWA for the hydrological part of the project.
	Project implementation	• (Duration) This project was delayed from its plan. It aims to be completed in 2019. - The project was delayed by 11 months due to issues arising from the budget transfer from KMA to WMO to SPC. - Natural disasters also delayed the project. - There were difficulties with adjusting the project schedule because of the approval process with the Fiji government. • (Budget) The KMA provides funding for respective phases of the project every year. However, all the phases of the project have been implemented simultaneously. - (Efficiency of project management) Accordingly, the WMO hopes to implement the project on the basis of the total budget of USD 1.2 million for the efficiency of the project management. • (Communication) Communication goes smoothly among stakeholders with regular meetings and organized structure. - However, inefficient approval process in the Fiji government often delays communication between Fiji and WMO, making it difficult to adjust the project schedule such as for a regular meeting. • (Human resources) Project managers of the WMO are now involved in 25 projects. • (Visibility) This project contributed to increasing the KMA's influence in the WMO community. - Such as CIFDP session within JCOMM, CIFDP official website, etc.
Evaluation	**Evaluation and feedback**	• An interim evaluation is underway for the CIFDP by the WMO EC's willingness
Post completion follow-up	**Follow-up measures**	• N/A

2. Lessons learned and recommendations for efficiency of similar projects

○ Preventive measures are required to prevent a period of preparation from being extended before launching a project. A project budget should be provided on time.

○ The efficiency of funding management should be increased so that project expenses can be within the budget.

3. Post-management and follow-up measures

○ Schedule management: The project from the second to the fourth phase originally planned to be completed by April 2019. However, as the launch of the second phase was delayed by 11 months, it was reported that the project duration needs to be extended. To avoid additional extension of the duration, a budget for the fourth phase (the 3rd year budget) should be provided on time in consultation with the WMO.

3.3 Analysis of multi-bilateral projects delivered by the WMO (SWOT Analysis)

○ The evaluation team conducted a SWOT analysis for multi-bilateral projects delivered by the WMO, on the basis of surveyed fact-findings and evaluation results.

- The team formulated a SWOT analysis strategy based on the defined Strength, Weakness, Opportunity, Threat (See Table 54).
- The SWOT analysis strategy includes Strength-Opportunity (SO) strategy, Weakness-Opportunity (WO) strategy, Strength-Threat (ST) strategy, and Weakness-Threat (WT) strategy.

<Table 42> SWOT Analysis

Strength (S)	Weakness (W)
• Addressing global issues by participating in global initiatives such as CIFDP, DARE, etc. • Possible to use professionalism of different parts of the WMO - Marine, aviation meteorology, climate, etc. - Taking advantage of the international organization and its network, and cooperation with other UN agencies • Easy geographical and political approach through the WMO - Africa, South America, non-priority partner countries, etc. • Possible to avoid overlap of projects between donor agencies	• Unclear project duration and inadequate budgeting in detail • Lack of consideration of stakeholders and local situation in determining project activities • Delay in project duration (entire project) – Frequent changes in personnel, administrative procedures, governance, etc. • Absence of platform for sharing the WMO's information - Lack of communication between KMA and WMO (reporting format, reporting system, etc.) - Difficulties in managing and tracking a budget by each phase of a project • Insufficient monitoring and evaluation (M&E) for WMO projects - Inadequate logframe (PDM), outputs, performance indicator • Absence of visible branding of KMA's ODA projects • High administrative costs compared to bilateral projects
Opportunity (O)	**Threat (T)**
• Securing the KMA's status and influence in the WMO community, with WMO projects - Selected as a WMO EC member (gaining an upperhand in the election) • Increasing efforts by the WMO to continuously secure funds • Emphasizing strengthening the partnership in line with organizational restructuring of the WMO • Continued increase in ODA budget by the KMA • Increased needs of global response due to growing disaster risks caused by climate change (SDG 13)	• The focus areas of the CPS of priority countries do not include weather and climate change (Only the Philippines' include disaster reduction). • Weather related projects are low on the list of ODA projects. • Fluctuations in recipient countries such as political vulnerability, changes in policy and personnel resulting from change in the political power

<Table 43> SWOT strategy based on SWOT analysis

		Strength (S)	Weakness (W)
		• Participating in global initiatives • Capable of using the WMO's professionalism - Professionalism in related areas -Taking advantage of international organization or network • Easy geographical, political approach through the WMO • Possible to avoid overlap of projects between donor agencies	• Unclear project duration and inadequate budgeting in detail • Delay in project duration (entire project) • Lack of communication between KMA and WMO (reporting formats, reporting system, etc.) • Project activities without considering stakeholders and local situation • Selection • Insufficient monitoring and evaluation (M&E) for WMO projects • Difficult to secure visibility of KMA • High administrative costs compared to bilateral projects
Opportunity (O)	• Capable of securing the status and influence in the WMO community through WMO projects • Increasing efforts by the WMO to continuously secure funds • Emphasizing strengthening partnership in line with organizational restructuring of the WMO • Continued increase in a ODA budget by the KMA • Increased needs of global response due to growing disaster risks caused by climate change	**=> Strength-Opportunity (SO) strategy** 1. Increasing participation in the WMO's successful programs (to promote the stability of multi-bilateral projects) - Scaling up recipient countries (expanding target regions) - Securing visibility of the KMA through KMA experts' participation (such as secondee, experts in different fields, support for capacity building, etc.) - Participating in Country Support Program 2. Preparing for the WMO EC election (securing the status and influence of the KMA) 3. Supplementing geographical, political approaches by participating in global initiatives	**=> Weakness-Opportunity (WO) strategy** 1. Revising WMO-KMA ToR concluded in 2012 2. Building a joint monitoring platform among international organization, donor country and recipient country - Improving communication system: regular meeting, reporting format, defining R&R, frequent information-sharing 3. Strengthening feasibility study - Dispatching experts, technical cooperaton with WMO - Conducting surveys on a variety of aspects of a project 4. Strengthening analysis of stakeholders (workshop) 5. Setting a schedule and budget plan after making a thorough PCN 6. WMO annual report: Adding a progress timeline against the original plan (writing a reason if there is any delay) 7. Coming up with measures to increase the visibility, such as displaying donor logo, information sharing, etc.
Threat (T)	• The focus areas of the CPS of priority countries do not include weather and climate change (Only the Philippines' include disaster reduction). • Weather related projects are low on the list of ODA projects. • Fluctuations in recipient countries such as political vulnerability, changes in policy and personnel resulting from change in the political power	**=> Strength-Threat (ST) strategy** 1. Launching project items, in which Korea does not have competence, by using professionalism of the international organization 2. Strengthening feasibility study and analysis of stakeholders - Identifying changes in a recipient country in advance through policy and technical feasibility surveys, as well as surveys on the country's internal and external environment 3. Expanding projects by connecting with global issues, such as climate change and disaster reduction	**=> Weakness-Threat (WT) strategy** 1. Building a process for carrying out multi-bilateral projects 2. Improving an official format of MoU and LoA between WMO and KMA when carrying out multi-bilateral projects 3. Logframe for planning projects in the field of meteorology based on M&E (Need to design PDM, output and performance indicators -> Improve transparency and feedback) 4. Enhancing the publicity of KMA's global projects (The KMA's visibility and the extent of reliance on the KMA will increase when international organization, donor country and recipient country cooperate).

3.4 Efficient Project Management Plan

3.4.1 Project Management by Phase

○ The evaluation team would like to offer suggestions from a perspective of project management by phase.

<Table 44> Project management by phase

Planning		Implementation		Evaluation	Post-completion follow-up
Identifying needs	**Project planning**	**Contract**	**Project implementation**	**Evaluation and feedback**	**Follow-up measures**
• Stakeholders' workshop - KMA, WMO, recipient agency, related agencies, users, etc. • Preliminary feasibility study - Expert dispatch - Analysis of various related fields - Cooperation with a technology division of the WMO - Outcome management	• Log-frame (PDM) - Performance matrix (Surveying baseline and end-line) - Outputs (using KO/KPI) - Planning M&E (interim and completion evaluation) • Making a PCN - Trilateral cooperation among KMA, WMO, and recipient country • Risk management plan	• Procurement process - Selecting professional agencies - Strengthening criteria for selecting qualified agencies	• Risk and issue management - Schedule management - Budget management • Monitoring - Process management - Reporting system (Building a communication system between stakeholders)	• Result-based evaluation - Budget evaluation - Performance evaluation • Lessons learned • Feedback	• Securing sustainability - Exit strategy - Follow-up measures

○ First, at the planning and evaluation stage, the KMA should actively express its voices, whereas for the implementation and follow-up measures, we recommend that they be fully delegated to the WMO.

- If projects are delegated to the WMO, as was the case in projects in Lao PDR and Mongolia, the KMA will have relatively less opportunities to participate in and give opinions in the planning process. Also, administrative costs are required to redesign and implement projects in order to make them suitable to the WMO's procedures. Accordingly, the WMO should take the lead in planning projects, and the KMA, the donor agency, needs to participate in the process of project planning or reviewing the plan.

- Therefore, the WMO has to take the lead in all processes of projects in accordance with project management methods, which were developed by the WMO itself in 2015. But at the same time, it needs to hold workshops for different stakeholders at the stage of identifying needs and planning, including KMA, WMO, recipient agency, related agencies, and users, in order to clarify demand, issues, and objectives of the project, as well as conducting a more thorough preliminary feasibility study.

- It is recommended that preliminary feasibility studies include not only meteorological experts (WMO experts, external consultants, and if necessary, KMA experts), but also performance management experts to plan projects' performance management (including performance indicators-baseline survey) from the planning stage. It is suggested to ensure that in feasibility studies, the following factors need to be considered, in addition to technical feasibility of the projects: stakeholders capacities, resources and time to implement (absorptive capacity), potential for sustainability of the initiative (exit strategy). Agree on the right mix of experts during the feasibility and scoping stage, combination of technical (meteorological, etc.) experts and project management/performance management experts.
- If technologies for projects go through technical review on the basis of the results of preliminary feasibility studies in cooperation with the WMO's related division, this is expected to strengthen the projects' technical verification, leading to a well-organized project plan in terms of administration and technology.
- It is recommended that projects fully use the WMO's KO and KPI for making a result-based project plan after identifying needs for projects. Also, a PCN should be made based on an agreement among KMA, WMO, and recipient country by reflecting their opinions. It also should specify roles and responsibilities of each of them to secure their project accountability regardless of changes in personnel involved in projects. These should be included in the risk management plan. Plus, specific roles and responsibilities between WMO, recipient country, and implementing agency (project coordinator: PC) should be reflected in LoAs.
- For result-based evaluation, budget evaluation and performance evaluation should be separately conducted in line with interim and completion evaluation plan. In this process, it is recommended to utilize various channels for evaluation. For instance, project monitoring (interim evaluation) can be conducted by person in charge of the project at the WMO. Completion evaluation can be done by external evaluators (hired by WMO or KMA) as well as can consider participation of recipient country, WMO, KMA, and etc. These various channels should be utilized based on the importance of the project and the amount of budget. In particular, at the project planning stage, budget evaluation has to be designed to specify project activities, outputs, and breakdown of expenses by project objective so that a final budget execution report can show whether outputs and objectives of the project were achieved by spending the budget according to the plan. To this end, the WMO and KMA need to communicate together for a complete revision of ToR,

including the way to send a financial report, or if not, to conclude a separate contract.[6)]

- Based on the results of the above evaluation, the KMA and the WMO can give feedback when similar projects are designed. Both can also jointly plan additional assistance for follow-up measures, when necessary.

○ Secondly, at the WMO-led implementation stage, it is recommended that criteria for selecting implementing agencies be toughened to select qualified professional agencies. Also, project schedule and budget management as well as response to risks and issues have to be actively made by using communication system with the selected implementing agencies (e.g. monitoring, process management, and reporting system).

- In addition to annual reports, both the WMO and the KMA should designate respective focal points as a regular communication channel, and have frequently communication through emails or regular consultation.

- If the reason for changing project tasks lies in financial issues or a lack of experts, the WMO can suggest the KMA solutions such as additional funding or dispatching professionals, instead of making a decision and reporting through reports, in order to expand the KMA's input in the project. Examples for this case include the removal of data digitization due to a lack of budget in the Uzbekistan project and the extension of the duration of the SWFDP-West Africa due to difficulties with raising funds.

- With these measures, the WMO is expected to address risks and issues, and at the same time the KMA to expand the visibility and the presence of its assistance.

○ Lastly, exit strategy for securing the project's sustainability has to be specified at the follow-up project planning stage so that necessary follow-up measures can be supplemented at the planning and implementation stage.

- In this process, the sustainability can be increased by using the VCP within the WMO, as was the case in the Uzbekistan project. Alternatively, when the funding from the KMA is not enough, the project would need to gradually use other funds from various sources such as CREWS, just as did in the SWFDP-West Africa.

6) The evaluation team learned from an interview with the WMO's budget team that result-based budget allocation is possible depending on how to make a budget breakdown by staff in charge of a project. The team also learned that the KMA and the WMO can consult and coordinate together the budget breakdown.

3.4.2 Project Management by Input

○ The evaluation team would like to offer the following suggestions from a perspective of project management by input.

<Table 45> Project management by input

Budget	Duration	Human resources
(Planning) • Drawing a budget based on adequate preliminary surveys and technical review • Allocating a budget for feasibility study and stakeholders' workshop • Allocating a budget for M&E • Establishing a budget breakdown associated with project outcomes (Implementation) • Executing a budget and reporting financial status according to a plan - Possible to cover expenses within the budget (securing flexibility) • Risk and issue management (budget) - Remaining balance and over-budget - Reporting issues • Consider funding for visibility initiatives	(Planning) • Securing sufficient time for planning a project • Setting a duration capable of implementing a project (Implementation) • Risk and issue management - Establishing plans to avoid delays in implementation (e.g. WMO's internal process, approval process in the recipient country, customs clearance, etc.) - Reporting issues when occurred	• Securing project accountability - Issues occurred by changes in personnel • Clear role and responsibility - Accountability Designation Form • Securing professionalism of implementing agency - Improving verification process - Securing a pool of experts • Participation by KMA's experts - Secondee: clear R&R - Expert: more project participation

○ First, the importance of sufficient preliminary surveys and technical review at the planning stage were emphasized in relation to project budget. In this regard, it is recommended that a budget be allocated for preliminary feasibility studies and shareholders' workshop.

- In addition, a budget should be allocated for monitoring and evaluation (M&E). A budget breakdown needs to be established based on project results, and according to this breakdown, expenses should be reported.

- Efficiency of budget management has to be increased to implement a project within the budget.

○ Secondly, it is important to ensure enough time to feasibly complete a project. All five projects delivered by the WMO showed low efficiency in terms of project duration because the duration was not practically set up at the planning stage. Accordingly, more thorough surveys on project duration are needed from the planning stage, including risk and issue management. In addition, measures should be established to deal with any delays in implementation resulting from potential risks at the implementation stage. If any issues occur, the issue should be reported as well. The WMO's internal project management guideline also needs to emphasize again that a project should be completed within the planned duration,

○ Thirdly, one of the significant issues raised was weakening project accountability resulting from changes in personnel involved in a project. Therefore, among others, a project manager should be designated who clearly defines roles and responsibilities of project-involved staff members. Also, it is urgently needed to implement a project on the basis of ToR (for the KMA's secondee as well). Moreover, to secure professionalism of project implementing agencies, the WMO's internal qualification process needs to be improved and a pool of proven experts should be secured. Plus, role and responsibility of a secondee from the KMA need to be clearly defined, such as a scope of participation in a project and communication.