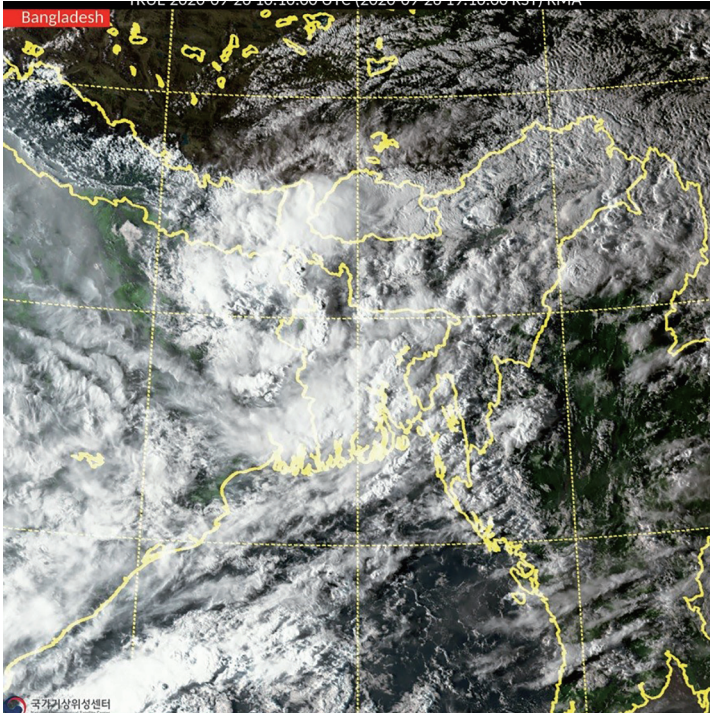


Support of the GEO-KOMPSAT-2A Receiving and Analysis System in Bangladesh



Project Background

Bangladesh is often affected by various natural disasters such as cyclones and associated storm surges, severe thunderstorms, nor'westers or tornadoes, heat waves, cold waves and heavy rainfall. The country also commonly experiences local heavy rainfalls. Most of these natural hazards or disasters are meso-scale in nature and associated with rainfall. However, it has difficulties responding to real rainfall climate because of a lack of dense rain gauge network, which is in high demand from users and stakeholders of Bangladesh Meteorological Department (BMD). Quantitative forecasting of rainfall and its verification also becomes very difficult due to the absence of high resolution observation.

BMD is responsible for providing various types of meteorological information to the government, private and public agencies, and the public to reduce the risks of disasters effectively, as well as to ensure safe navigation in water ways (inland and sea voyage), tourism, driving etc. In this situation, utilization of satellite information and

high resolution NWP model's simulated rainfall are urgently required to fulfill the demands of clients.

Project Summary

Duration: 2019-2021 (3 years)

Management Agency:

Korea Meteorological Administration (KMA)

Implementing Agency:

Korea Meteorological Institute (KMI)

Beneficiary Agency:

Bangladesh Meteorological Department (BMD),
Ministry of Defense (MOD)

Funding Source: KMA

Target Location: Bangladesh (Dhaka)

Project Budget: 2.5 M USD

Contact:

SEO Sungyoung, Manager, ssy1308@kmiti.or.kr

Project Objectives

The objectives of the project “Support of the GEO-KOMPSAT-2A Receiving and Analysis System in Bangladesh” (hereinafter referred to as “the Project”) are to improve responses to natural disasters and reduce damage to residents by collecting information through a meteorological satellite, GEO-KOMPSAT-2A (hereafter “GK2A”), receiving and analysis system in Bangladesh.

Key Activities

- Investigating the meteorological status and relevant infrastructure for meteorological satellite utilization in Bangladesh
- Selecting a service provider for the installation of GK2A receiving and analysis system
- Installing GK2A receiving and analysis system
- Supporting the operation of the system and data analysis through capacity building such as training programs and experts secondment

Implementation Status

An expert group consisted of experts from the National Meteorological Satellite Center (NMSC) and the Korea Meteorological Institute (KMI) conducted a preliminary technical investigation in July 2019. And a service provider was selected in April 2020. KMI provided online training on capacity building for a working-level group of BMD in November 2020.

Expected Results

Expected outputs after the successful completion of the Project are:

- Enhanced quality of weather observation forecasting;
- Improved early warning system for meteorological disasters; and
- Enhanced capacity of BMD



▲ Preliminary technical investigation, July 2019



▲ Invitational training for policy makers, December 2019



“This project is of great significance because the latest satellite technology is applied to the existing Bangladesh weather observation infrastructure. I would like to express my gratitude to the Korea Meteorological Administration and Korea Meteorological Institute of Technology.”

- Shamsuddin Ahmed, Director General, BMD -

What is GEO-KOMPSAT-2A Receiving and Analysis System?

GK2A Satellite is the next generation geostationary meteorological satellite that took over the meteorological roles of Communication, Ocean and Meteorological Satellite (COMS) and performs meteorological and space weather observation tasks.

COMS		GK2A Satellite	
Launched in June, 2010 		Taking over the role of the COMS 	
1 Communication Payload 2 Ocean Payload 3 Meteorological Payload		Basic Specification	
Payload	Meteorological payload, space weather payload	No. of Channels	16 channels, 3 types of space weather channels
Weight	2,849kg	Lifespan	10 years

Improvement of spatial resolution	Increase of observation frequency	Increase of the number of channels																											
Visible 1km >> 0.5km Infrared 4km >> 2km 	<table border="1"> <tr> <th>Region</th> <th>COMS</th> <th>GK2A</th> </tr> <tr> <td>Entire Earth (full disk)</td> <td>1 time (3 hours)</td> <td>6 times (10 min)</td> </tr> <tr> <td>Asia-Pacific Region</td> <td>4 times (15 min)</td> <td>30 times (2 min)</td> </tr> <tr> <td>Korean Peninsula</td> <td>4 times (15 min)</td> <td>30 times (2 min)</td> </tr> </table>	Region	COMS	GK2A	Entire Earth (full disk)	1 time (3 hours)	6 times (10 min)	Asia-Pacific Region	4 times (15 min)	30 times (2 min)	Korean Peninsula	4 times (15 min)	30 times (2 min)	<table border="1"> <tr> <th>Channel Type</th> <th>COMS</th> <th>GK2A</th> </tr> <tr> <td>Visible channels (monochrome)</td> <td>1 channel</td> <td>4 channels (color)</td> </tr> <tr> <td>Near-infrared channels</td> <td>0 channels</td> <td>2 channels</td> </tr> <tr> <td>Infrared channels</td> <td>0 channels</td> <td>4 channels</td> </tr> <tr> <td>Total Channels</td> <td>1 channel</td> <td>10 channels</td> </tr> </table>	Channel Type	COMS	GK2A	Visible channels (monochrome)	1 channel	4 channels (color)	Near-infrared channels	0 channels	2 channels	Infrared channels	0 channels	4 channels	Total Channels	1 channel	10 channels
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GK2A launched on December 5, 2018 is available for diverse observations owing to its 16 channels, which was increased from previous 5 channels of COMS.

GK2A also allows to observe the entire sectors at 10-minute intervals, enabling speedier monitoring of severe weather phenomena to reduce the impacts of meteorological disasters. In addition, its high performance meteorological sensor (AMI) provides more precise observations. GK2A will produce a total of 52 types of meteorological products.

Primary Products (23 types)										
Fog	Cloud Detection	Atmosphere Instability Indices	Vertical Humidity Profile	Vertical Temperature Profile	Atmospheric Motion Vector	Total Column Ozone	Convective Initiation	Rainfall Rate	Cloud Phase	Cloud Top Height
Sea Surface Temperature	Land Surface Temperature	Snow Cover	Sea Ice	Aerosol Detection	Dust Aerosol Detection	Volcanic Ash Detection	Aerosol Optical Depth	Dust Aerosol Optical Depth	Radiation	Cloud Top Pressure

Secondary Products (29 types)										
• Forest Fire	• Snow Depth	• Cloud Effective Radius	• Potential Accumulated Rainfall	• Absorbed Shortwave Radiation(surface)	• Overshooting Top	• Vegetation Index	• Sea Surface Current	• Cloud Liquid Water Path	• Downward Longwave Radiation(surface)	• SO2 Detection
• Fractional Vegetation Cover	• Cloud Type	• Cloud Ice Water Path	• Visibility	• Upward Longwave Radiation(surface)	• Total Precipitable Water	• Land Surface Emissivity	• Cloud Amount	• Cloud Layer/Height	• Outgoing Longwave radiation(TOA)	• Tropopause Folding
• Surface Albedo	• Cloud Optical Depth	• Probability of Rainfall	• Angstrom Exponent Product	• Icing	• Turbulence Detection					

▲ 52 types of meteorological products