



Meteorology for the Capacity Development in Underdeveloped Areas: A case study of Tuquan County, Inner Mongolia, China



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Case Provider: CMA Department of Disaster Risk
Reduction (DDRR) and CMA Training Centre (CMATC)

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Background

- Location: Northeastern China
Status: Underdeveloped
Opportunities: Rich natural resources
Suit for agricultural and animal husbandry industries
Challenges: Lack of technology, infrastructure and investment

To fill and narrow the local gap in capacity for being **sustainable**



infrastructure

weather, climate, hydrological, environmental and other related information and services tailored

investment

targeted assistance

science & technology

CMA

advanced technology

management



Our Actions

Apply Science and Technology

Provide advanced meteorological monitoring, forecasting and service technologies to help the recipient improve its work in weather and climate with science and technology.

Serve Industries

Provide targeted agricultural and animal husbandry technologies and resources to register increased economic benefits therefrom.

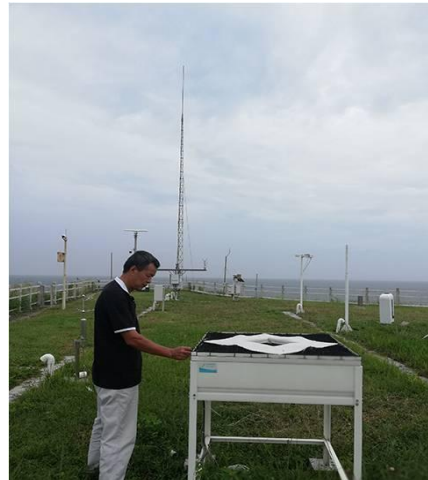
Resource Integration

The unified national organization and management of meteorological services as a sector was taken advantage to help underdeveloped regions improve their capabilities.

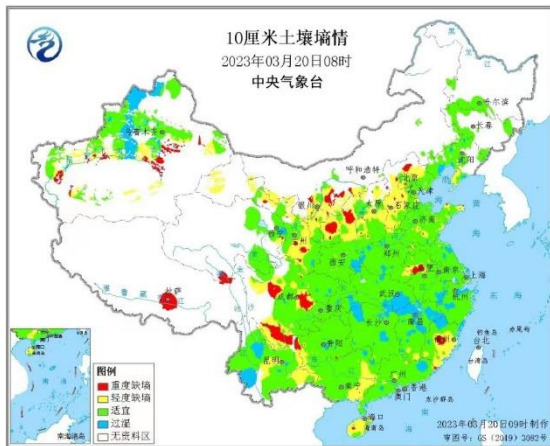
Action I: Improve the local capacity to apply science and technology.



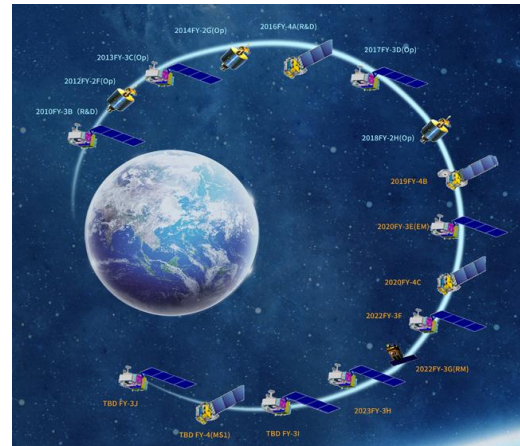
additional weather radars and sounding equipment installed in places prone to meteorological disasters



solar and wind energy



soil monitoring and analysis laboratories



meteorological satellites



more intensive meteorological data used to provide particular monitoring and forecasting products

Action II: Improve the local capacity to serve industries.

- particular zonation of agro-climate;
- demonstration of crop varieties;
- popularization of replicable meteorological technologies for protected agriculture;
- introduction of the animal husbandry improvement and veterinary epidemic prevention service system;
- the provision of relevant technical training.



Action III: Give play to the capability in resource integration.

- A number of plans and programs such as work plan, emergency plan and action plan were formulated as a multi-stakeholder joint effort to promote local capacity;

- the particular zonation of agricultural climate was furthered to optimize agricultural planting structure, protect and utilize local black soil resources;

Eco-agriculture industrial park



Nanhu Park



Natural Oxygen Park



- unique climate resources were tapped with such activities as labeling Tuquan as the Natural Oxygen Park (NOP);

- with the Climate-based Quality Assessment of purple garlic to promote local economy.

Purple garlic



Application of WCD principles



Principle I: Holistic approach

CMA, the Tu-quan government and the IMAR Meteorological Service have adopted a holistic/systematic approach, with a top-down value chain formed through overall planning at the strategic level, **detailed breakdown of specific tasks, integration of meteorological technology into industries, special training for personnel skills, and overall improved competence of all staff** in attempt to **upgrade the agricultural industry and increase grain production and farmers' incomes.**





01

Policy documents used as guidance

- The Emergency Plan of Tuquan for Meteorological Disasters
- The "Meteorology +" Enabling Action Plan of Tuquan
- The Work Program of Assisting Tuquan in Fully Improving the Capacity Building of Meteorological Support in Service of Rural Revitalization (2022-2024)

Management mechanisms for meteorological disaster prevention and reduction

- The system of designating key offices
- The **"three call and response"** mechanism for major meteorological disaster warning
- The **"four stop"** mechanism for high-level meteorological warning signals
- The **emergency co-response and information sharing** mechanism
- The **grid-based management** mechanism for meteorological disaster prevention and reduction






02

Supported with coherent sector action



03

CMA together with the National Rural Revitalization Administration (NRRA), the Ministry of Natural Resources (MNR), the Ministry of Emergency Management (MEM) and others has promoted the establishment of a **long-term mechanism to prevent poverty returning due to disasters** in a bid to empower the underdeveloped Tuquan sustainably.

	Actions
 Meteorological disaster prevention	<ul style="list-style-type: none">• Targeted monitoring and forecasting services• Management mechanisms• The countywide emergency command platform• Risk warning services
 Agrometeorological service	<ul style="list-style-type: none">• Meteorological forecasts for key growth periods of major crops, agrometeorological disasters, weather-based pest and disease• The observation and intelligent processing of data• diverse and particular products• Replicable meteorological technologies
 New energy meteorological service	<ul style="list-style-type: none">• The annual assessment of solar energy resources• Warning for severe weather
 Tourism meteorological service	<ul style="list-style-type: none">• Investigation of meteorological disasters in scenic spots• Emergency plan• Jointly release relevant regional meteorological service info• Investigation of meteorologically driven landscapes• NOP designation for Laotou Mountain
 Ecological civilization	<ul style="list-style-type: none">• Real-time fire monitoring and high impact weather forecasting and warning• Monitoring and assessment of the countywide vegetation and ecological quality• Weather modification operation• Emergency support

Principle IV: Efficiency and Innovation



Improve efficiency

Build the capacity quickly with the deployment, application and transformation of advanced technologies.

The quantitative assessment, prediction and warning system of an ongoing agricultural drought

The forecasting system of particular farmland irrigation

The system of meteorological services for direct water-saving irrigation

The particular climate zonation of corn varieties

The technology for particular meteorological services for protected agriculture

The CLDAS soil moisture query system

Boost the deployment of technologies with flagship demo sites

meteorology + high standard farmland in Taiping Township

soil moisture grid-based monitoring and forecasting products integrated with meteorological satellite remote sensing and ground observation data for high-standard farmland

water-saving irrigation meteorological diagnosis and forecasting technology

Classify and tailor training for various local personnel

Local grassroots cadres: help improve their management and professionalism

Messenger development program: mainstream meteorology into local fields

Agricultural experts offer field guidance and technical extension at the farmland level

Training of samplers, inspectors and testers

384 livestock diagnosis, treatment and epidemic prevention personnel: improved breeding technology of frozen semen of cattle and the improved technology of crossbreeding of multi-line sheep

Public: Folk art entertainments with local characteristics on disaster prevention and reduction

Principle V: Cooperation, partnerships, equity and inclusion

CMA has led the process as a planner

CMA has taken the initiative to give play to **the strength of its national meteorological structure**, reinforcing the coherence in action at the **national, provincial, municipal and county levels** as a synergy.

1

Co-management with other ministries

The mechanism of joint consultation, joint issuance and joint warning with **12 ministries** and commissions of, among others, natural resources, transportation and water has been established. Under the umbrella of cooperation and collaboration between ministries and enterprises, the meteorological sector has begun to **cooperate with enterprises**.

2

Positive response from Tuquan government

The People's Government of Tuquan County has issued the Emergency Plan for Meteorological Disasters in Tuquan and the **"Meteorology +" Enabling Action Plan** of Tuquan in response to the support initiative by CMA in order to **jointly deliver meteorological services** to ensure the local economic and social development.

3

Principle VI: Result-based CD

Organization and management

A leading group has been set up for a **regular review of the improved capacity** of Tuquan, with the existing problems discussed and addressed in a timely manner, and the follow-up actions elaborated upon and mapped out according to the plan.

The field fact-finding tour

The competent CMA administrator has led the **evaluation expert team** to the beneficiary for a field investigation, including an **on-site inspection and guidance** on relevant capacity improvement activities, and a timely correction and remedial of problems and deficiencies identified in this connection.

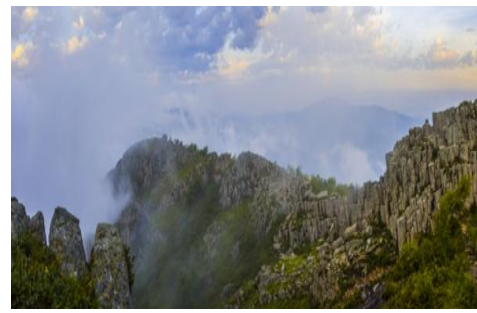
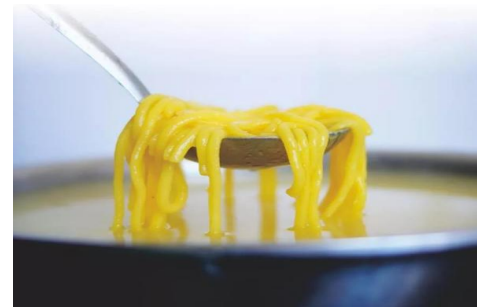
Working mechanism

A robust scheduling practice has been ensured to coordinate and promote routine work; the implementation of the respective responsibilities of the internal offices of meteorological services, the directly affiliated organizations, and relevant provincial (regional, municipal) meteorological services; and to **give a clear picture of the exact reality including gaps and allow for timely adjustments and improvements** according to the progress.



High-quality development

Results: prosperity, beauty & out of poverty



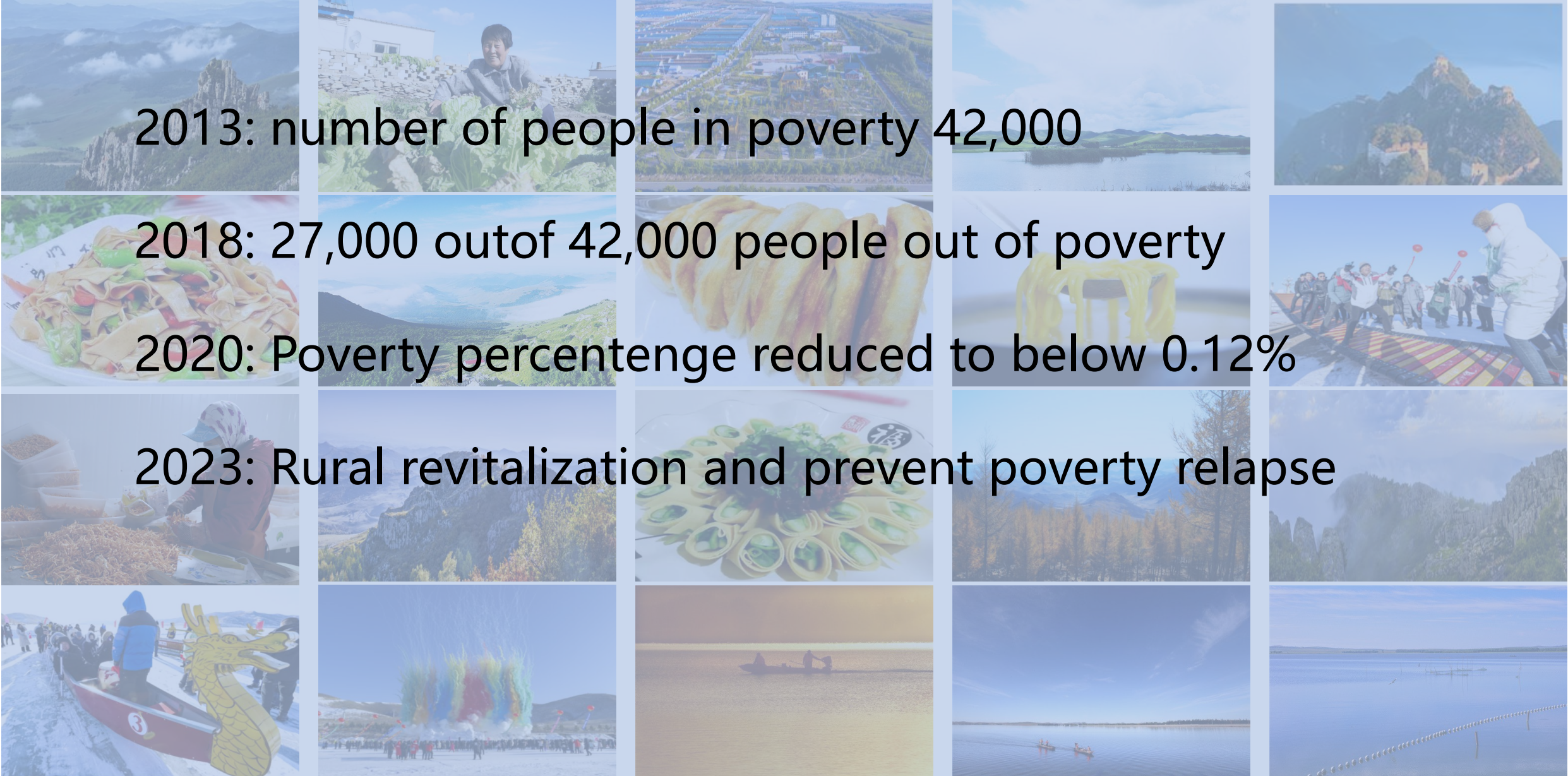
Results: prosperity, beauty & out of poverty

2013: number of people in poverty 42,000

2018: 27,000 out of 42,000 people out of poverty

2020: Poverty percentage reduced to below 0.12%

2023: Rural revitalization and prevent poverty relapse



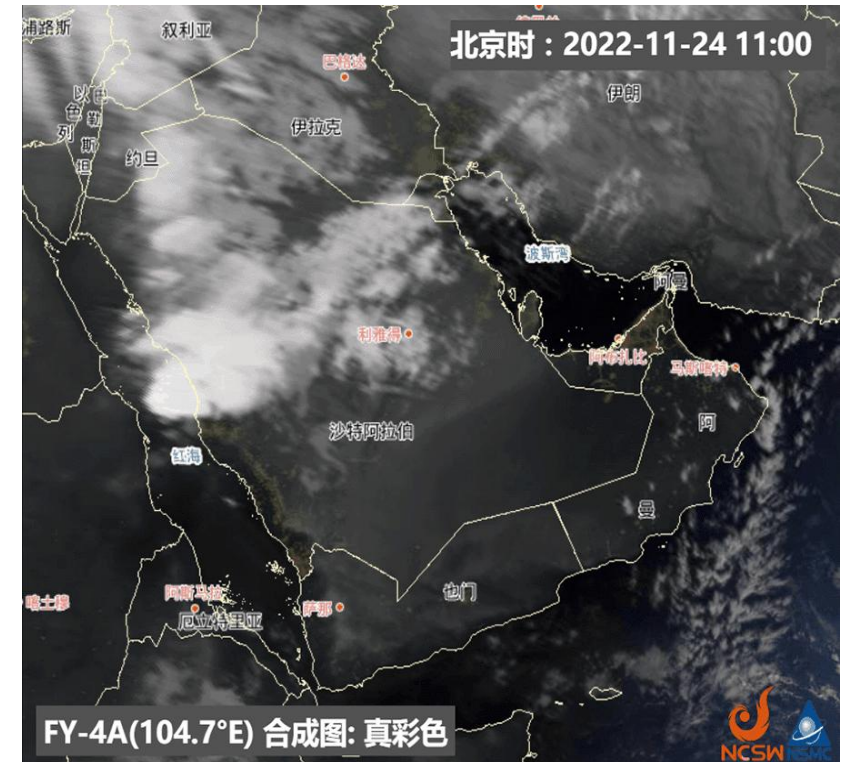
Chinese meteorological satellite technologies will serve Arab states development

FY meteorological satellites are key members of WMO Integrated Global Observing System (WIGOS). So far, China Meteorological Administration (CMA) has successfully lifted off **19 FY meteorological satellites, with 7 currently in orbit**. The satellite observation data are **open and shared in real time to the world**, providing data products and services to **126 countries and territories** around the globe.

风云二号卫星定点向西移后，增加的观测区域示意图



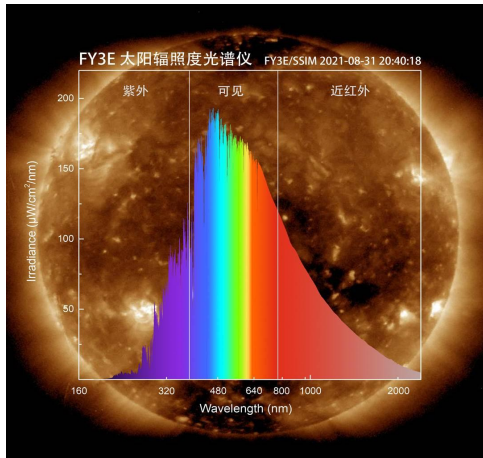
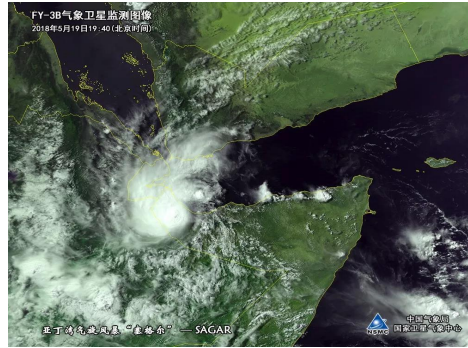
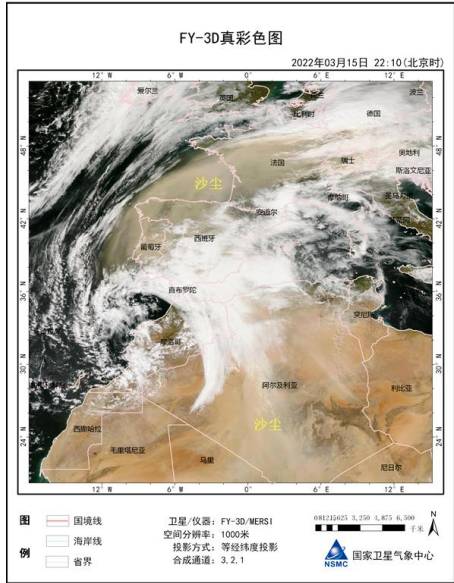
← adjust the position of FY-2H in 2018



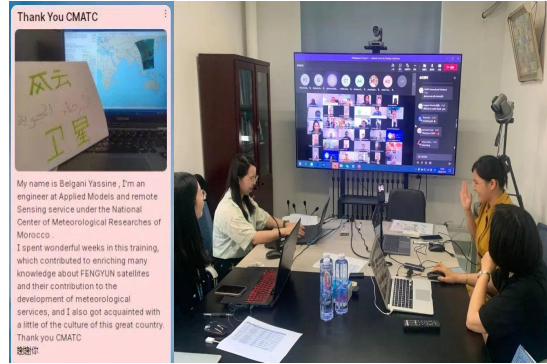
FY-4A carried out monitoring from 03:00 to 13:00 UTC on November 24, 2022 when heavy rain caused damages in Saudi Arabia

Other Actions on CD

satellite monitoring data and services



international training



equipment & technology



global forecast and NWP



visit to CMA



THANKS!

Contact us at: intcmatc@cma.gov.cn

