



JAXA's Activity for Sustainable Development Goals(SDGs)

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Japanese govt initiatives for SDGs & Space



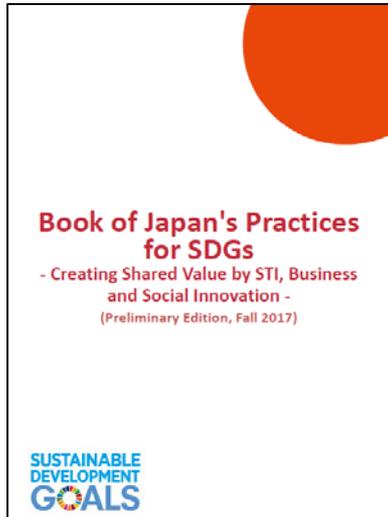
PM Abe in 1st SDGs Promotion HQ mtg

- Japanese government established the **'SDGs Promotion HQ'** headed by the PM and consisting of all Ministers

https://japan.kantei.go.jp/97_abe/actions/201605/20article2.html

8 Priority Areas;
including space initiatives (EO applications for **Forest, Floods, Air Pollution...**)

'Japan's Practices' announced at STI Forum (May 2017)



- Dec. 2016, the HQs adopted **'The SDGs Implementation Guiding Principles'**

<http://www.mofa.go.jp/files/000252819.pdf>

- May 2017, the Advisory Board for the Promotion of Science and Technology Diplomacy **'Recommendation for the Future: STI as a Bridging Force to Provide Solutions for Global Issues'**

<http://www.mofa.go.jp/files/000255799.pdf>

4 Recommendations;
including space initiatives (in addition to above, **ISS research, CB thru smallsat missions**)

http://www.jst.go.jp/EN/about/sdgs/doc/book_of_practices_for_SDGs_201709.pdf

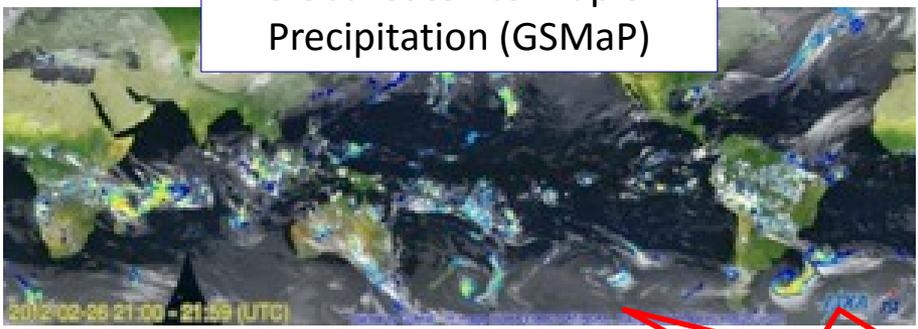
① Flood Damage Mitigation

Satellite observation data and in-situ data are merged to predict floods in downstream areas a few days advance. System alarms & informs citizens of evacuation plans.

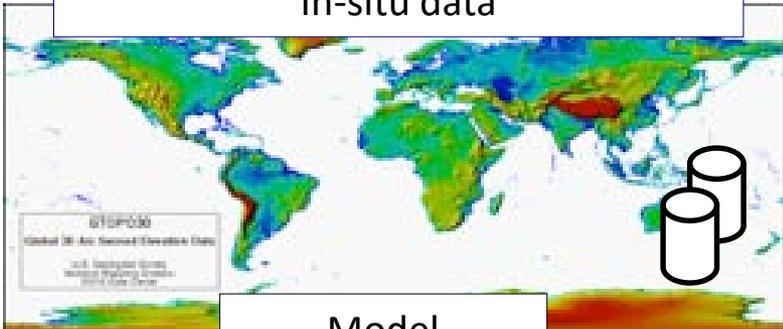


11.5 reduce the number of deaths caused by disasters, including water-related disasters

Global Satellite Map of Precipitation (GSMaP)



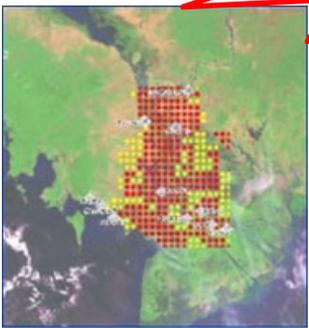
In-situ data



Model



Warning



Global satellite data is effective to grasp the situation on water level of international cross-border rivers. In Bangladesh, it takes a few days before the downstream area is flooded after a flood in an upstream area occurred. Flood forecast enables crop harvesting prior to the extreme weather event.

Partners



(Under preparation)



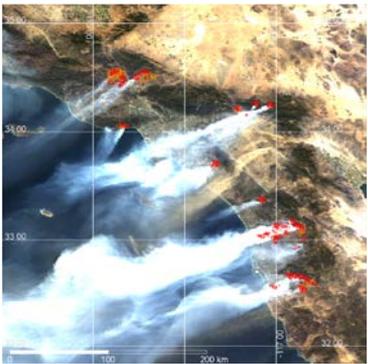


② Protect Our Health from Air Pollution

Earth observation satellites monitor haze and particles PM2.5. Satellite data & in-situ data detect hot spots to forecast air pollution.

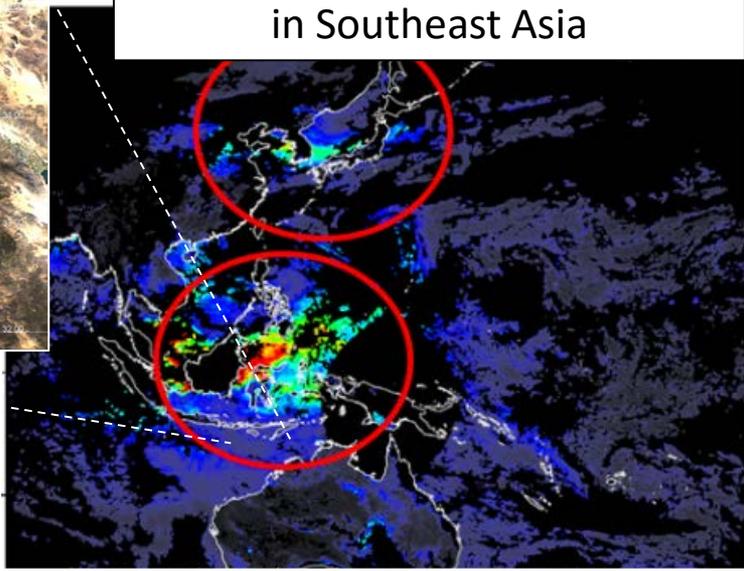
JAXA Himawari Monitor P-Tree System accurately releases

information on air pollution estimates.



Red dots represents fires.

Captures the wide-spread haze in Southeast Asia



A forest fire in the island of Borneo in Southeast Asia and air polluting particles



ASEAN Specialized Meteorological Center (ASMS)



Estimates when/where/how haze migrates



Alert to local citizens

11.6 Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality



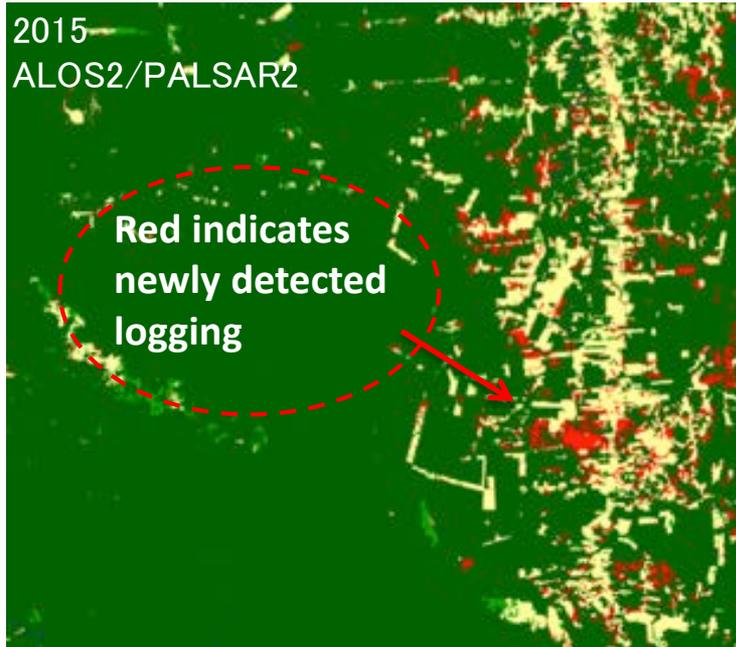
15.1 ensure the conservation, restoration and sustainable use of terrestrial ecosystems

③ Save the Tropical Forests



ALOS-2

Radars penetrate clouds, provide data on an all-weather, day/night basis. JAXA promotes the use of L-band SAR for forest monitoring to reduce emissions from deforestation and forest degradation.



Detecting deforested areas (Brazil)



70% decrease in illegally deforested areas

JICA-JAXA Forest Early Warning System in the Tropics (JJ FAST) service started in November 2016. Logging area information analyzed by ALOS-2 is provided for authorities and governments. It is more accessible to anyone with computers or mobile devices than it ever was before.

Partner



Currently, information of the Amazon and Central & Southern Africa areas are available. Information will be available to the 77 tropical-area countries in early 2018.



④ Protection against Infectious Diseases

JAXA uses Digital Elevation Models (DEMs) to create maps of places that are difficult to access, in order to implement efficient measures for infectious diseases.

JAXA provides 3D satellite data from the ALOS to combat infectious diseases like polio.



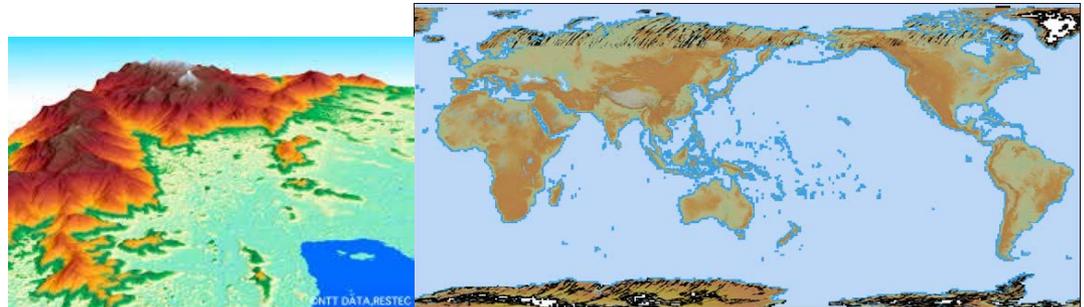
The place to collect sewage samples in Niger



Acknowledging elevation differences identifies the flow of water



WHO uses Digital Elevation Models to specify locations to collect sewage sample for virus research (Niger, Africa)



ISS Contribution for SDGs



Medical Science



Education/
Capacity Building



Space-derived
Technology



Material Science

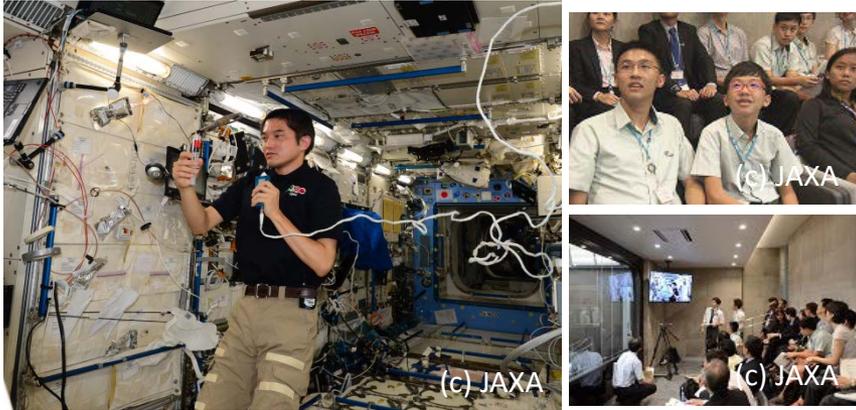


Earth Observation



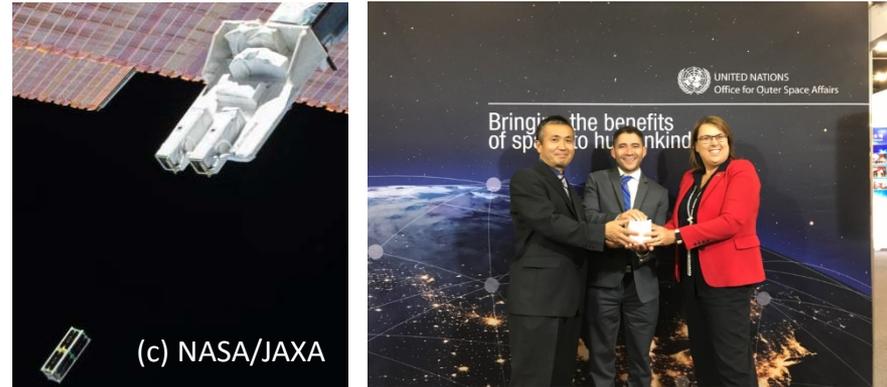
Education / Capacity Building

Asian Try Zero-G



- ◆ Purpose for educating Asian students and young professionals.
- ◆ Japanese astronaut performs selected experiments proposed by youth from Asian countries.
- ◆ September, 2016: JAXA Astronaut Takuya Onishi performed 5 themes proposed by six countries. (Singapore, Vietnam/Malaysia, Indonesia, Thailand, and New Zealand)

KiboCUBE



- ◆ UNOOSA/JAXA collaboration programme.
- ◆ Provides the opportunities to deploy CubeSats from Kibo for developing and emerging countries.
- ◆ Purpose for capacity building for developing and emerging countries.
- ◆ Kenya and Guatemala were selected for 1st and 2nd round respectively.

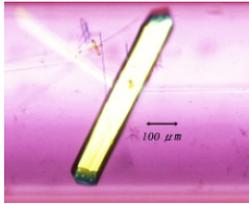
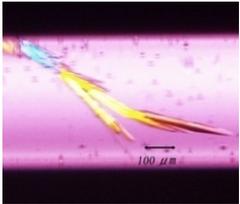
Medical Science

Protein Crystal Growth (PCG) Research for New Drug Design

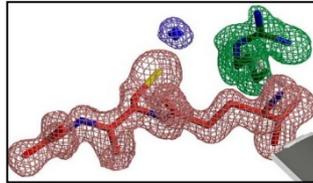
- ◆ Make high quality of protein crystal under micro-gravity environment
- ◆ New drug design for infectious disease, cancer, and lifestyle-related disease

Flow of Drug Design from PCG

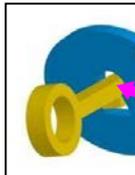
High-quality crystallization in Kibo
On Earth In space



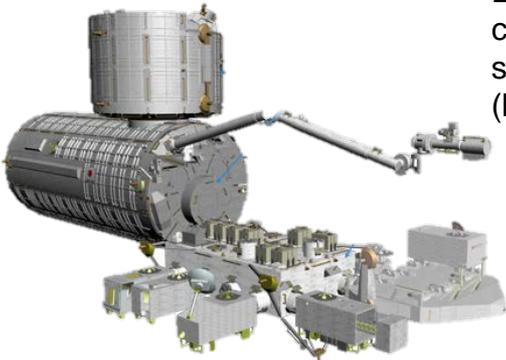
Structural Analysis on Earth
Unraveling molecular structures affecting diseases



Structure Based Drug Design
Effective exploration of drug candidates (keys) with apparent structure of disease-causing protein (keyhole)



Drug / enzyme candidate

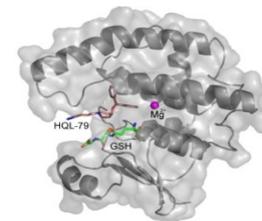


Cooperation with Industry



Strategic Partnership

- Crystallizing Peptide and Protein in Kibo
- Data measurement and structure determination on ground



Space Derived Technology

- ◆ Products developed for use in space have also been adopted as spin-off products on Earth.

Spacesuit Research



Cooling Vest Undergarment



- ◆ Strict safety standards of space are being adapted in many industries, such as aviation, automotive, and food industries.

Software Independent Verification and Validation (IV&V) for Spacecraft



Space Food



Food Safety Standard on Ground



Growing awareness of SDGs in Asia-Pacific Region (APRSAF-24)



- ✓ 24th session of APRSAF (APRSAF-24) was held from Nov.14 to 17, 2017 in Bengaluru, India.
- ✓ 538 participants from space agencies, government ministries, development aid agencies, international organization of 31 countries/region

Heads of Agency (HOA) Session

was organized under the theme:

“Space Technology Inputs for Resolving National Priority Issues toward Achieving Sustainable Development Goals (SDGs) ”



VNSC, GISTDA, ROSCOSMOS, ANGASA, ISRO, JAXA, ISA, LAPAN, KARI



Growing awareness of SDGs in Asia-Pacific Region (APRSAF-24)



In the “**Joint Statement**” adopted at the end of APRSAF-24, the following statements were included as key points shared among the participants during APRSAF-24:

2. Contribution of space technology to achieving SDGs

Space technology can have a major role in achieving the 17 goals of Sustainable Development Goals (SDGs) by contributing to solving regional issues such as disaster risk reduction, water resource management, and agricultural management. Through the active cooperation among the countries in this region based on their expertise acquired through the multifarious activities taken in each country, national and regional issues can be tackled collaboratively.

5. Advancement of APRSAF activities

.....Considering that the Asia-Pacific region accounts for more than two-thirds of the world’s population and features a wide diversity of geography, climates, and people, our efforts in this region under the APRSAF framework will have a great influence on global society and the Earth. Therefore, it is important to connect our regional interests gathered at APRSAF to global efforts such as the SDGs adopted at the United Nations,

Space Activities have more possibilities to Contribute to Sustainable Development Goals



1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS	SUSTAINABLE DEVELOPMENT GOALS



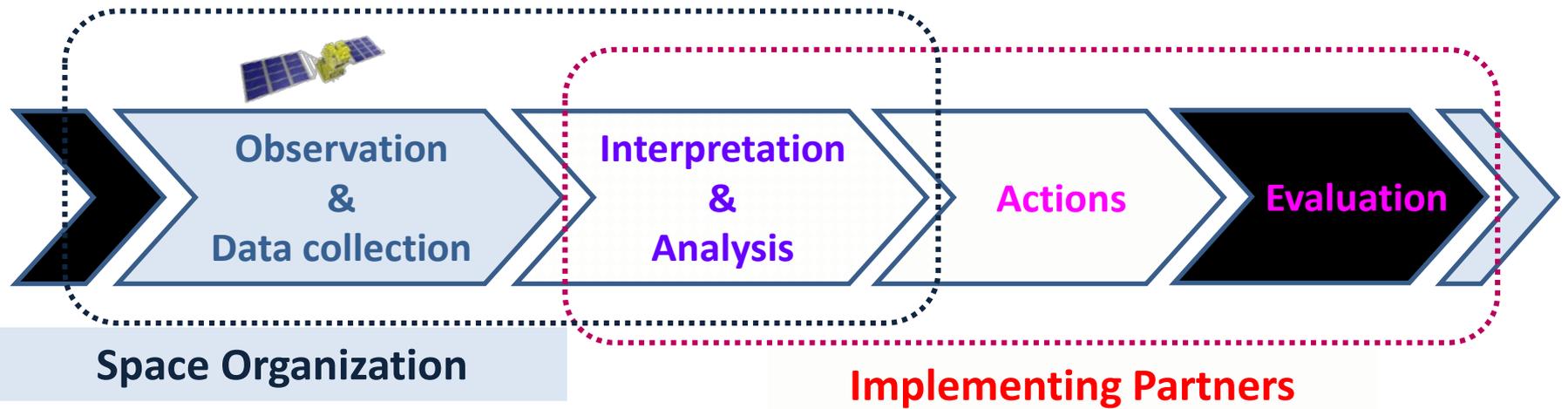
Thank you for your attention!

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National Eight Priority Areas and Policies	Satellites	Implementing Partners
(1) Empowerment of All People		
(2) Achievement of Good Health and Longevity		Geospatial Information Authority of Japan (GSI)
(3) Creating Growth Market, Revitalization of Rural Areas, and Promoting Technological Innovation	ALOS-2 GOSAT GPM GCOM-W	Japan Meteorological Agency (JMA)
(4) Sustainable and Resilient Land Use, Promoting Quality Infrastructure	Himawari QZSS	National Institute for Environmental Studies (NIES)
(5) Energy Conservation, Renewable Energy, Climate Change Measures, and Sound Material-Cycle Society	(Advanced SAR & Optical)	Japan International Cooperation Agency (JICA)
(6) Conservation of Environment, including Biodiversity, Forests and Oceans	(GOSAT-2 & 3) (EarthCARE)	NTT DATA Corporation (NTT DaTa)
(7) Achieving Peaceful, Safe and Secure Societies	(GCOM-C)	
(8) Strengthening the Means and Frameworks of the Implementation of the SDGs	(SLATS)	More