Examples of lessons learned from the past international mechanisms for cooperation of JAXA

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France/Japan seminar - Cross cutting perspectives in space law
Vienna, 7 April 2016
A/AC.105/L.297 (11 May, 2015)

“The Legal Subcommittee, in 2016, should identify proposals to mark the fiftieth anniversary of the Outer Space Treaty in 2017, as well as the outcome of the Subcommittee’s Working Group on the Review of International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space, in particular in view of the “UNISPACE+50” theme;”

Lessons Learned of international cooperation in relation with UNISPACE+50 theme should be taken into consideration.
Among UNISPACE+50 cross-cutting areas, we focused on international cooperation for **sustainable development using space-based technology**.

- JAXA’s cooperation with **UN entities**
  - United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)
  - United Nations Educational, Scientific and Cultural Organization (UNESCO)

- JAXA’s cooperation with **Multilateral Development Bank**
  - Asian Development Bank (ADB)
1. JAXA’s cooperation with ESCAP
In Dec 2008, JAXA and ESCAP concluded MOU.

Objective:
Applications of space technology for
• disaster management
• bridging digital divide
• water resource management, etc.

MOU defines to convene periodic consultations, etc.

Under the MOU, JAXA and ESCAP concluded Project Documents.

JAXA effectively raised awareness and promoted outreach activities of “Sentinel Asia”, “GSMaP” etc.
Overview of cooperation (1) Sentinel Asia Step-2

WINDS (Japan)

Data transmission via WINDS

ALOS (JAXA)

IRS (ISRO)

THEOS (GISTDS)

FORMOSAT (NARLabs)

KOMPSAT (KARI)

XSAT (CRISP)

ESCAP conducted outreach activities for the application of RFP.

Users

Regional Servers mirroring Central Server in 11 countries

Central Server in Japan

Volcano

Flood

Wildfire
Overview of cooperation (2) GSMaP

Global Satellite Mapping of Precipitation (GSMaP)
using GCOM-W, GPM, and others (European and US satellites)

GSMaP (Global) observed Hurricane Patricia and Olaf, and Typhoon Champi: 20-24 Oct. 2015, hourly animation

ESCAP promoted utilization of GSMaP collaborating with ESCAP/WMO Typhoon Committee (14 countries).
2. JAXA’s cooperation with UNESCO
In June 2011, Gov. of Japan and UNESCO exchanged letters to improve flood warning capacity of Pakistan.

Under the exchange of letters, on March 2012, JAXA and UNESCO signed IPA for Phase 1 Project.

JAXA provided technical assistances and GSMaP data, and also developed elevation information of land surface by ALOS data, etc.

UNESCO undertook overall management.
Overview of cooperation

- JAXA provides GSMaP data in Indus river basin.
- Consultants calibrate GSMaP data, using ground-based rain gauges data.
- The calibrated GSMaP product is used in the Indus Integrated Flood Analysis System (Indus-IFAS), developed by ICHARM(*), and improved the accuracy.
- Pakistan authorities are expected to operate the system.

Rainfall of GSMaP

* ICHARM: Global Centre of Excellence for Water Hazard and Risk management
3. JAXA’s cooperation with ADB
In March 2010, JAXA and ADB concluded LOI (Letter of Intent).

Objective:
Applications of space technology for:
- disaster management
- climate change mitigation & adaptation
- forest monitoring
- water resource management

LOI defines JAXA’s technical assistance, capacity development, secondment of JAXA personnel, workshops, etc.

Under the LOI, JAXA and ADB signed PA for each TA projects.
Overview of cooperation: Flood Risk Management (1)

Participating countries: Bangladesh, the Philippines, and Viet Nam

- Improvement of the flood warning lead time from 3 days to 5 days.
- Mitigation of loss of assets and damages

Additional information:
- Direct distribution of information to the people by using cellular phones
- Input to the flood forecasting model of GSMaP Precipitation data calibrated by rain gauges on the ground

Diagram:
- Rain Gauges → Calibration → Flood Forecasting System → SMS distribution system → Flood Warning
Overview of cooperation: Flood Risk Management (2)

**Counterpart Agency**

- Philippines
- Bangladesh
- Viet Nam

- Coordinate with related organizations and communities for pilot projects
- Assign TA project director to supervise and coordinate TA activities
- Participate in workshops, trainings, dialogues
- Apply TA outputs and evaluate the usefulness

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**Executing Agency: ADB**

- Coordinate the whole TA
- Engage and supervise consultants

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**Implementing Agency: JAXA**

- Study and verify the calibration method of GSMaP
- Technical assistance for applying sat-data to the existing system
- Direction to the consultants, coordination with stakeholders

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**Consultants (international, national)**

- General design, GSMaP calibration
- IF system development
- Applying calibrated GSMaP to the existing system
- Developing WebGIS and SMS distribution system

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**Advisory Committee: Univ. Tokyo etc.**

- Advise to design and develop the systems applying remote sensing, GIS and ICT

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Partnership Agreement

Engagement and supervision

Support

Advice
4. Lessons Learned
Lessons Learned (1)
Continuity of assistance and consultations in the long-term

✓ Duration of technical projects: typically 2-5 years.
✓ After the projects, donated countries have to operate the system, including maintenance.
✓ However, officials or experts who learned the operational methods usually move to another sections or entities.

✓ A mechanism to assure continuity of assistance and consultations from donor countries is important.
✓ An agreement to define cooperative framework, including consultations and capacity development, is beneficial.
✓ Especially, capacity building efforts are useful.
Lessons Learned (2)
Taking advantage of different expertise of participating entities

✓ Space agency **usually has the technical expertise of:**
  - satellite operation and data application
  - calibration method of satellite data, etc

✓ However, space agency **does not have the expertise of:**
  - design and development of the operational system,
  - calibration using the local ground-based data,
  - knowledge, experience and networks with communities on social development issues in the donated countries

✓ Combination of different expertise of participating entities is indispensable.

✓ Different roles and responsibilities should be taken into consideration in the mechanism.
Thank you for your attention.
Backup Chart
KiboCUBE

On September 2015, JAXA and UNOOSA announced launch opportunities from Kibo for small satellites built by developing nations, to improve their capacity of space technologies. (CubeSat (1U)/ once a year from 2017-2019)