

A New APRSAF initiative; Asian Beneficial Collaboration through Kibo Utilization: **Kibo-ABC**



Logo of Kibo-ABC
Designed by ANGKASA

The 50th session of
Scientific and Technical Subcommittee of
Committee on the Peaceful Uses of Outer Space

Kibo Utilization Office for Asia
Japan Aerospace Exploration Agency (JAXA)

Outline of This Presentation

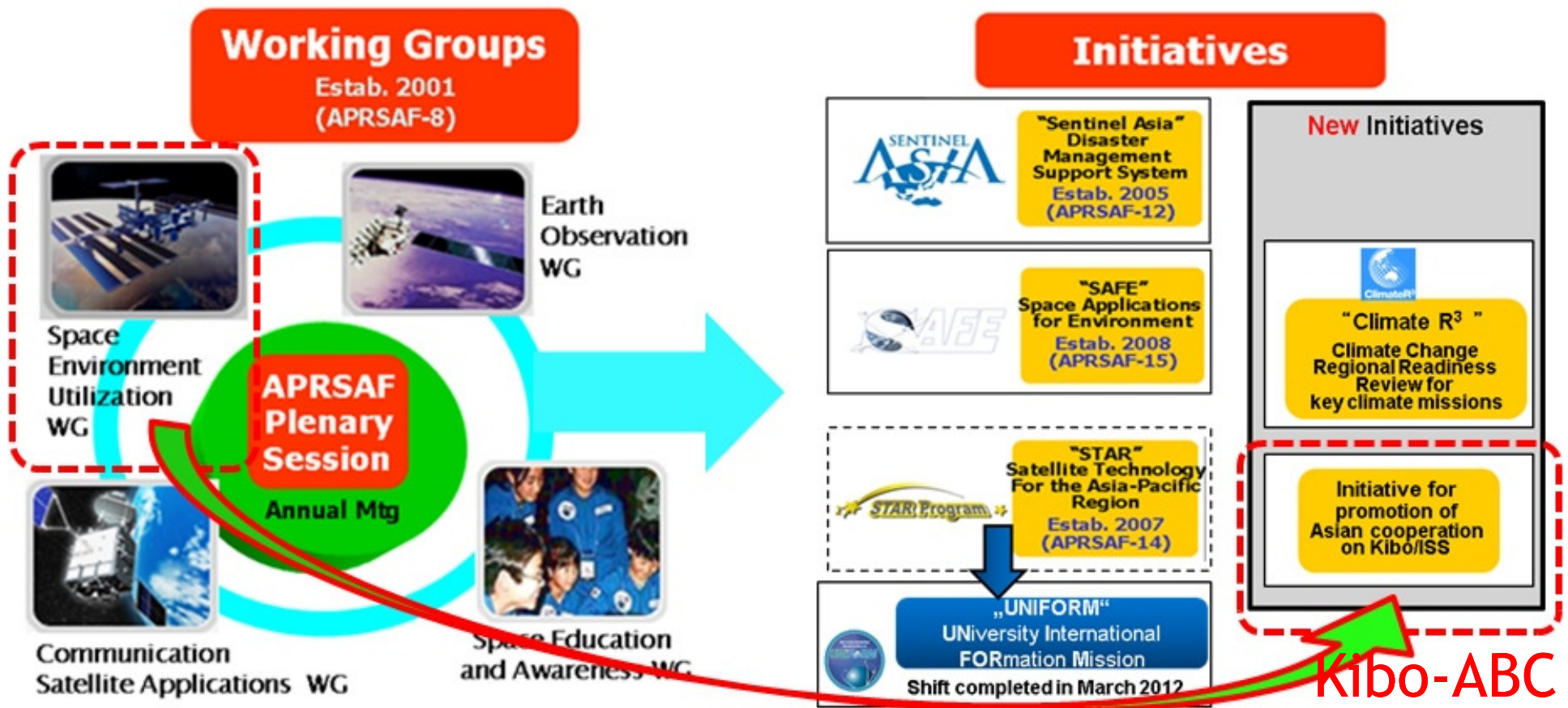
1. What is Kibo-ABC?
2. History of the Establishment
3. Objectives and Activities
4. Achievement and future plans
5. JAXA's other related cooperation in Asia
6. Further information

1. What is Kibo-ABC?

Kibo-ABC:

A **S**ian **B**eneficial **C**ollaboration through “Kibo” Utilization

- An initiative established by the Space Environment Utilization Working Group (SEUWG) of the APRSAF.
- Aims to promote ISS/”Kibo” utilization in the Asia-Pacific region.



2. History of Establishment(1/2)

- Space Environment Utilization Working Group (SEUWG) was established in APRSAF during its 12th session in 2005
 - ✓ A Parabolic Flight Education Program for Asian university students was offered by JAXA in the session.
 - ✓ This was the starting point of SEUWG's work toward space environment utilization in Asia, including "Kibo" utilization.
- After the start of space experiments in "Kibo" in 2008, the Asian "Kibo" Mission Planning Task Force of APRSAF SEUWG was established in 2009.

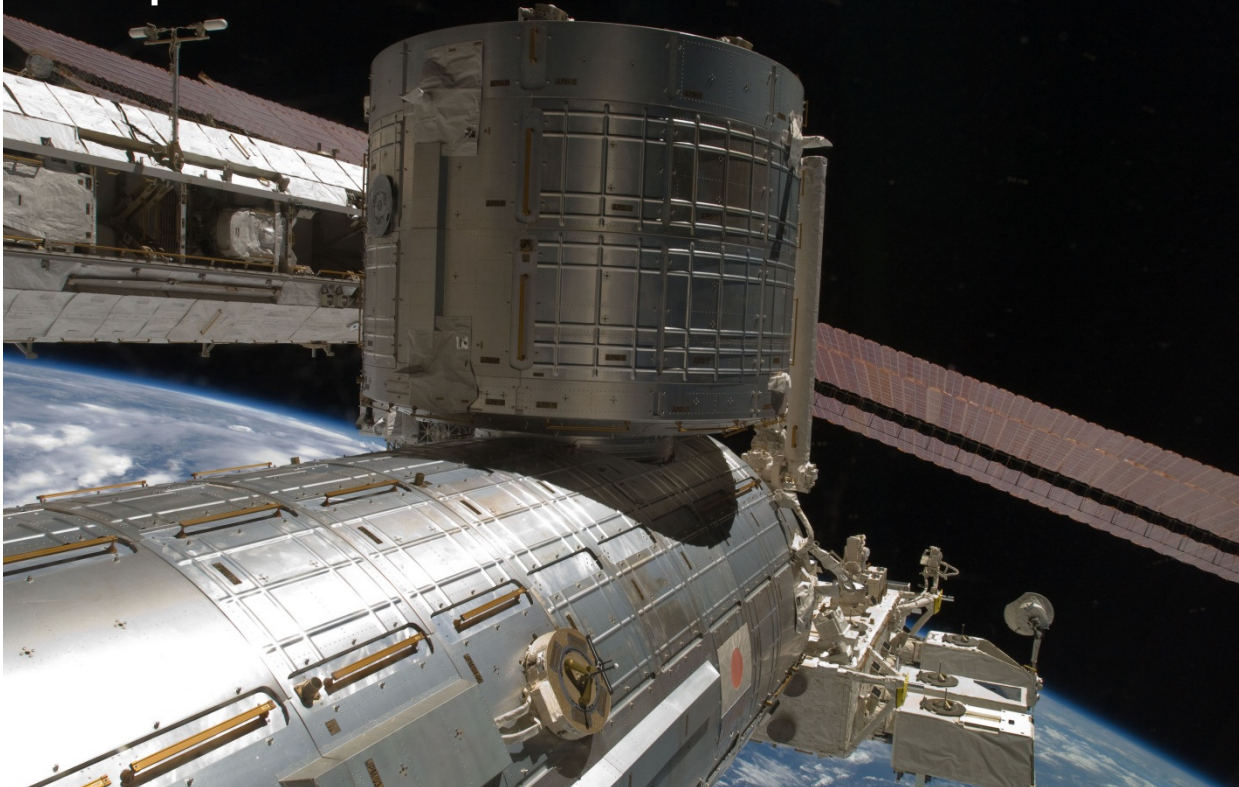
2. History of Establishment(2/2)

- The “Space Seeds for Asian Future (SSAF) 2010-2011” was performed under the framework of the Task Force, 2011.
 - ✓ The **first Asian joint mission**
 - ✓ Seeds were gathered from **4 Asian countries**, sent to “Kibo” and then retrieved to Earth after about **4.5 months stay in Kibo**.
 - ✓ The returned seeds were utilized for **fundamental research and educational purposes** in each country.
- This successful outcome prompted SEUWG to establish Kibo-ABC.
- Terms of Reference (TOR) was enacted on 21 November, 2012 at the Kick-off meeting of Kibo-ABC; **Kibo-ABC was officially established** on 21 Nov, **2012**.

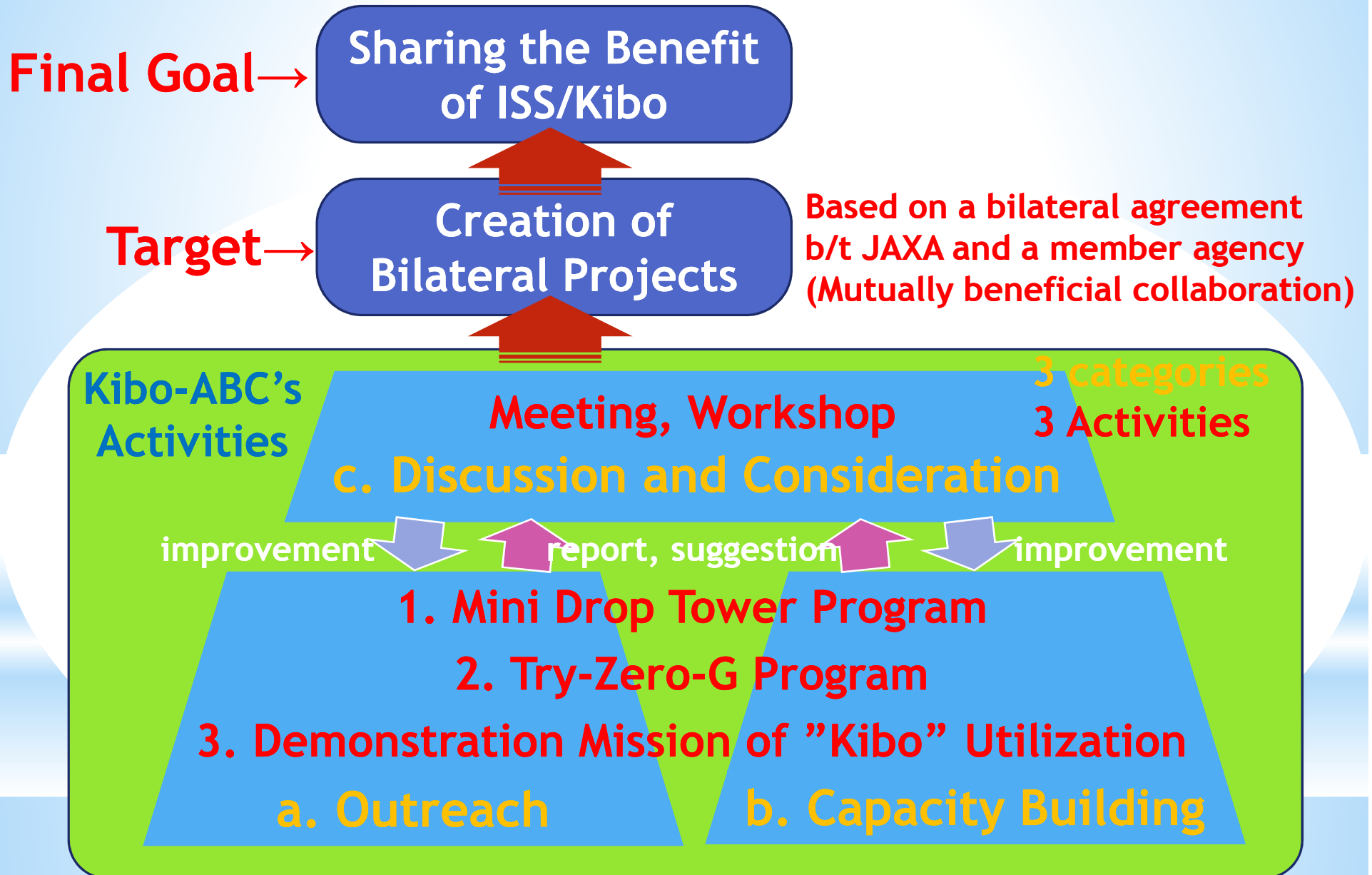
3. Objectives and Activities(1/4)

Objectives

- To share recognition of the significance and values of the International Space Station (ISS)/Japan Experiment Module "Kibo" among Asian countries; to share the benefit of Kibo
- To expedite the creation of bilateral projects between Japan and other Asian countries on "Kibo" utilization



3. Objectives and Activities(2/4)



3. Objectives and Activities(3/4)

Kibo-ABC's Activities (3 categories and 3 activities)

Three Categories:

a. Outreach

(on “Kibo” utilization towards Asian community)

b. Capacity Building

(of experiments to be performed by Asian space agencies)

c. Discussion and Consideration

(toward the creation of concrete cooperation)

3. Objectives and Activities(4/4)

Three Activities:

1. Mini Drop Tower Program

- Member agencies organize seminars on microgravity in their own countries using the mini drop tower.
- Member agencies disseminate the use and utility of the equipment in each country.



2. Try-Zero-G Program

- JAXA's in-orbit educational campaign program on the ISS.
- JAXA invites proposals for experiment through member agencies. A domestic selection is carried out by each agency.
- Final selection, including JAXA's assessment on their safety and feasibility, is jointly made by members.
- Selected themes are implemented in "Kibo" by astronauts.



3. Demonstration Mission of "Kibo" Utilization

- To provide an opportunity to promote understanding and gain experience on "Kibo" utilization.
- As a step toward full-fledged "Kibo" utilization.
- Basically joint "Kibo" utilization missions such as "Space Seeds for Asian Future" are implemented.



4. Achievement of Mini Drop Tower program (Seminar in Indonesia)

- LAPAN organized the science festival in Bandung, Indonesia, Oct. 2012.
- Japanese micro-G scientist of JAXA were invited to give a lecture on micro-G science and introduced and demonstrated the mini drop tower instrument.



JAXA scientist giving a lecture



Mini drop tower demonstration



Participants in the lecture



A student asking a question

4. Achievement of Try Zero-G program

- JAXA performed the 2 series of Try Zero-G experiments in 2011 and 2012.
- 33 fundamental scientific experiments were proposed by children in Asia-Pacific region, and 13 themes from **Australia**, **Bangladesh**, **Malaysia** and **Pakistan** have been performed by Astronaut in Kibo.
- The next Try Zero-G experiments are being planned to be implemented during Japanese astronaut Wakata's long duration stay in the ISS next winter.



Australia



Bangladesh



Malaysia



4. Achievement of Demonstration Mission (Space Seeds for Asian Future 2010-2011)



- Asian countries' (Indonesia, Malaysia, Thailand, Vietnam and Japan) collaborative mission;
- Seeds from these countries were;
 - ✓ transferred to ISS/Kibo by Japanese launch vehicles H-IIB and HTV(KOUNOTORI) in January 2011;
 - ✓ retrieved to Earth after 4.5 months;
 - ✓ and returned to each country July 2011.
- Each of the 4 countries utilized the returned space seeds for **fundamental research and educational purposes.**



Indonesia



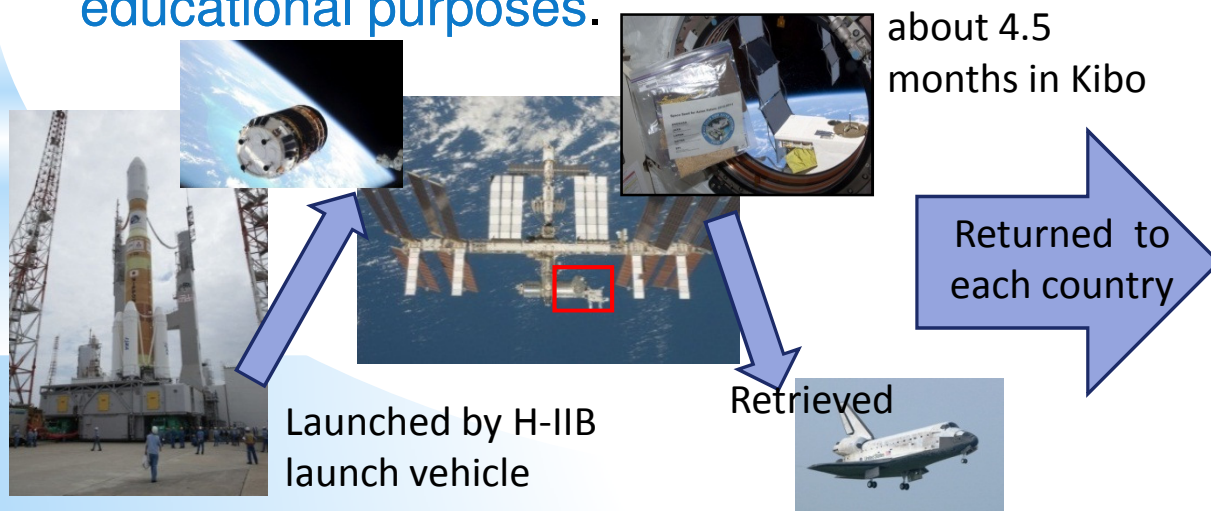
Malaysia



Thailand



Vietnam



Vietnam



Malaysia



Indonesia



Thailand

4. Achievement of Demonstration Mission (Space Seeds for Asian Future 2010-2011)



Well over one thousand students from four Asian countries participated in this program.



Malaysia



Indonesia



Thailand



Vietnam



4. Achievement of Demonstration Mission (Space Seeds for Asian Future 2010-2011)



Example of Space Seeds Utilization: Malaysian Space chili cultivation contest

- Malaysia held a space seeds cultivation contest in 2012.
- **More than one thousand students** from about 50 junior high schools and high schools participated in the contest.
- Finalist; students from 6 schools presented their results and efforts to judges and the first prize winner was selected and commended on Oct. 2012.
- **Students who won the first prize participated in APRSAF-19** in Malaysia and reported their achievement and gains through this program on behalf of Malaysian students.



Space Chili cultivated by students



Malaysian students from 6 finalist schools of the contest



Presentation of 1st prize winner in APRSAF-19

Feedback from participating students in Malaysia (Space Seeds for Asian Future 2010-2011)



Space Seed

Feedback from participating students (Space Seeds for Asian Future 2010-2011)



Thailand



Indonesia



Videos of feedback from Indonesian and Thai participants are also available in the following link:

http://iss.jaxa.jp/en/kuoa/news/ssaf_130121.html

4. Future plan: Next Demonstration Mission; SSAF2013



Logo of SSAF2013

Designed by NSTDA

7 Kibo-ABC member organizations are participating in this program.

Objective:

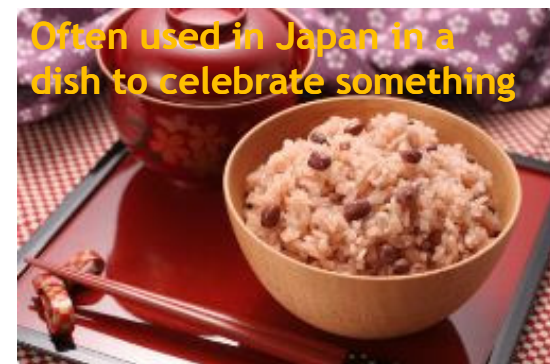
To **promote understanding** and **gain experience** on “Kibo” utilization; same as SSAF2010-2011

Feature:

- Upgraded program of SSAF2011
 - **Enhance Educational Aspect**
 - **To experience different phases** of the Kibo Utilization procedure
- 2nd Demonstration Mission of “Kibo” Utilization
- 2nd Multilateral Collaboration on “Kibo” Utilization

4. Future plan: Next Demonstration Mission; SSAF2013

- To use seeds (beans) of **AZUKI**: *Vigna angularis*
- New Trial:
 - **To culture them in Kibo** and filmed by an Astronaut.
 - **Down-link the Video**
 - Video is **shared with Asian people through the Internet.**
 - Participants in each country try its **control experiment** almost simultaneously to compare their results; are able to “feel Space near”.



Many Azuki related studies have been conducted on the ground, but there has yet to be a space experiment; Good objective for our mission

5. JAXA's other related cooperation in Asia

Parabolic Flight Micro-G Experiment for Asian univ. students

- JAXA has been providing **Parabolic Flight Micro-G** experiment opportunities to Asian university students every year; 7 times so far, **since 2006**.
- **About 40 students** from **Malaysia** and **Thailand** have participated in this program, and 20 students experienced micro-G.
- This program **encourages students** to study Micro-G science and **promotes space environment utilization** among young generations in Asia.



Micro-G experiment March, 2012



Malaysia



Thailand



Meeting before the flight



Micro-G experiment on the Airplane

5. JAXA's other related cooperation in Asia

Parabolic Flight Micro-G Experiment for Asian univ. students



JFY2006



JFY2007



JFY2009



JFY2010



JFY2011



JFY2012

5. JAXA's other related cooperation in Asia Cooperation between UNESCO Jakarta Office

UNESCO E-learning session

- **JAXA experts gave a seminar** on utilization of space environment including micro-G to Asian students and researchers, Oct. 2012, through Internet at an **E-learning session organized by UNESCO Jakarta Office**.
- **6 sites in Asia-Pacific region**, including Universities of Indonesia, Malaysia and Japan, were connected and about **50 participants** heard the seminar.



Speakers of JAXA
through monitor



Participants in
Jakarta (Indonesia)



Participants in Bali
island (Indonesia)

6. Further information

➤ Secretariat of Kibo-ABC

Kibo Utilization Office for Asia (KUNOA) of JAXA is working as the secretariat of the Kibo-ABC initiative.

➤ Terms of Reference (TOR)

You can download it through Kibo-ABC website.

➤ Website of Kibo-ABC

You can access it through APRSAF website

http://www.aprsaf.org/initiatives/kibo_abc/index.php

The image displays two screenshots of the APRSAF website. The top screenshot shows the 'About Initiatives' page, which lists three initiatives: Sentinel-Asia, SAFE (Space Applications For Environment), and Kibo-ABC. Each initiative is accompanied by a brief description and a logo. The bottom screenshot shows the 'Kibo-ABC (Asian Beneficial Collaboration through "Kibo" Utilization)' page, which provides detailed information about the program, including its objectives and background. The website header includes the APRSAF logo, the 19th APRSAF meeting information (APRSAP-19 in Malaysia from December 11 to 14, 2012), and a search bar.

JAXA will continue collaborating with Asian partners and strive to enhance these relationships through Kibo-ABC!

Thank you for your attention!

