

# Practical GIS Data Solution & Satellite Data Analysis Trainings for SDGs

March 13, 2019

International Cooperation Department

***Japan Space Systems***

## Satellite & GIS data are useful tools for solving global issues and Sustainable Development Goals (SDGs)

- Various Fields
  - Agriculture
  - Forestry
  - Fishery
  - Mining, Energy Resources
  - Environmental Assessment
  - Urban Development
  - Disaster Management
  - Economics
  - Sci-tech, etc.



Japan Space Systems has **capacity building programs** for developing human resources for **solving global issues** since 2012. **Over 90 participants from 30 countries** had our original programs

Japan Space Systems has also cooperated with JICA & JOGMEC to have capacity building programs for **250 participants from 20 countries**

- In Japan
  - JICA Training Programs
  - ABE Initiative & Kizuna Program
  - Original Programs
- In Countries
  - Botswana (since 2012)
  - Zambia (since 2016)
  - Uganda (2017)
  - And Other Countries World-widely

In Japan Training for Rwandan Participants  
December 2017

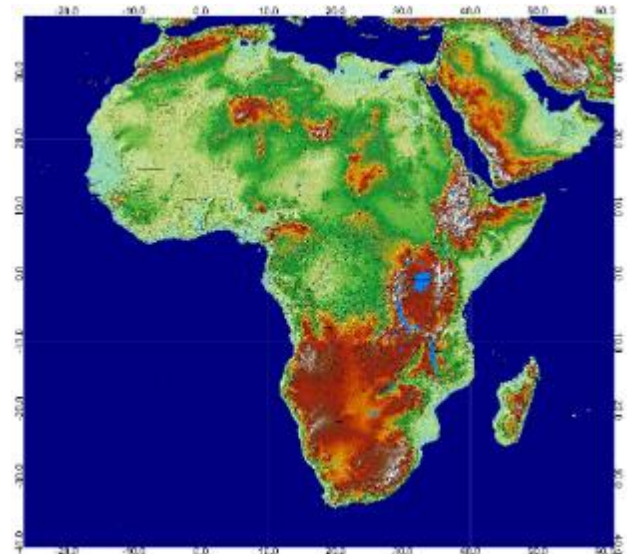
- Participants 5 – 30
- Belongs Laptop PC (Windows Recommended)
- Course 3-hour, 1-day, 3-day, 1-week, 2-week  
→Depended on Content & Schedule
- Feature Training with open-free data & software  
→Participants can continue to use satellite data after the program

Date	Content	Note
1 <sup>st</sup> Day AM	Orientation Software Installation	
1 <sup>st</sup> Day PM	Practice I	Satellite Data Download Map Creation
2 <sup>nd</sup> Day AM	Practical Field Survey	Field Survey Training with Satellite Data & Tools
2 <sup>nd</sup> Day PM	Practice II	Compilation of Satellite Data & Survey Data
3 <sup>rd</sup> Day AM	Practice III	Intermediate Analysis (NDVI, 3D Model Creation, etc.)
3 <sup>rd</sup> Day PM	Presentation	Presentation about Results (Skills Check)

- Developing connections with Japanese companies through Capacity Building Programs
  - Especially with African countries



- Propulsion of Satellite Data Utilization
  - Making participants possible to use satellite data sustainably after the capacity building
  
- Proposal for SDGs
  - Solutions based on our performances are available through the capacity building programs
  
- Rwandan Case as Model
  - Cooperating with Univ. of Tokyo
  - Developing Advanced Model
    - to AFRICA ALL FROM Rwanda

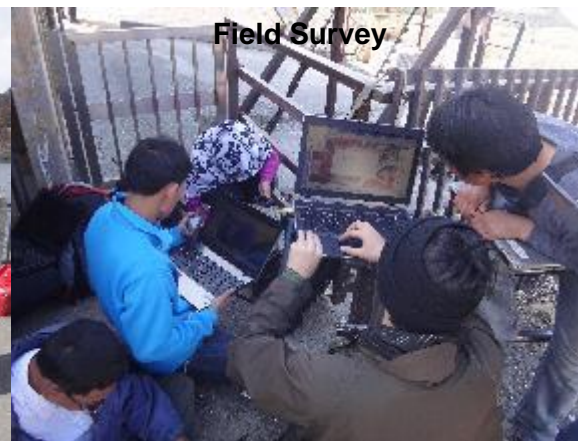


**Object** Capacity Building for Remote Sensing & GIS  
Data Analysis

**Location** Tokyo, Japan

**Date** 2012 & 2013

- Basic Data Analysis Training with QGIS (Open & Free Software)
- Practical Field Survey Training for Deforestation
- Networking Development



**Object** Capacity Building for Remote Sensing & GIS Data Analysis

**Location** Antananarivo, Madagascar/ Lusaka, Zambia

**Date** February 10 – 21, 2014

- Basic Data Analysis Training with QGIS (Open & Free Software)
- Practical Field Survey Training for Deforestation, Mining Pollution and Land Degradation
- Networking Development





**Object**            Illegal Deforestation Monitoring  
**Location**        Madre de Dios, Peru  
**Date**              July 15 – 17, 2015

- Basic Data Analysis Training with QGIS (Open & Free Software)
- Practical Field Survey Training for Deforestation
- Web-GIS Installation Experimentally



Object            REDD+  
Location        Boalemo, Gorontalo, Indonesia  
Date             December 2015 and January 2017

- Basic Data Analysis Training with QGIS (Open & Free Software)
- Practical Field Survey Training for Deforestation
- CO2 Emission Calculation Training
- GIS Data Sharing System (Web-GIS) Installation

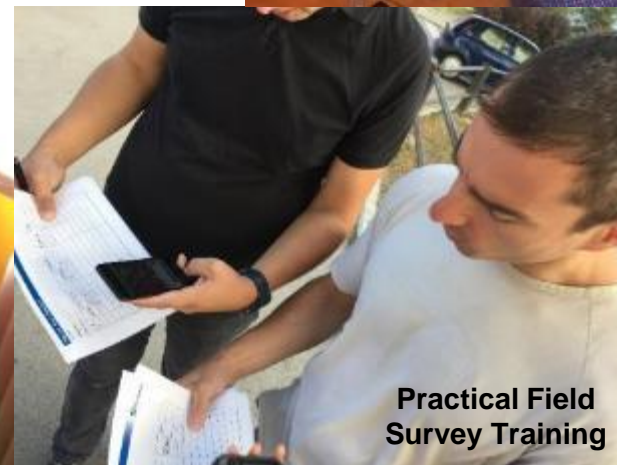


**Object** Mineral Development & Environmental Assessment

**Location** Bor, Serbia

**Date** 2015 -

- Basic & Advanced Data Analysis Training with QGIS (Open & Free Software)
- Practical Field Survey Training for Deforestation
- In-Japan Remote Sensing GIS Training
- GIS Data Sharing System (Web-GIS) Installation



Object Heavy Metal Assessment

Location Kabwe, Zambia

Date 2016 -

- Basic & Advanced Data Analysis Training with QGIS (Open & Free Software)
- Practical Field Survey Training for Deforestation
- GIS Data Sharing System (Web-GIS) Development



Group Photo



Field Survey



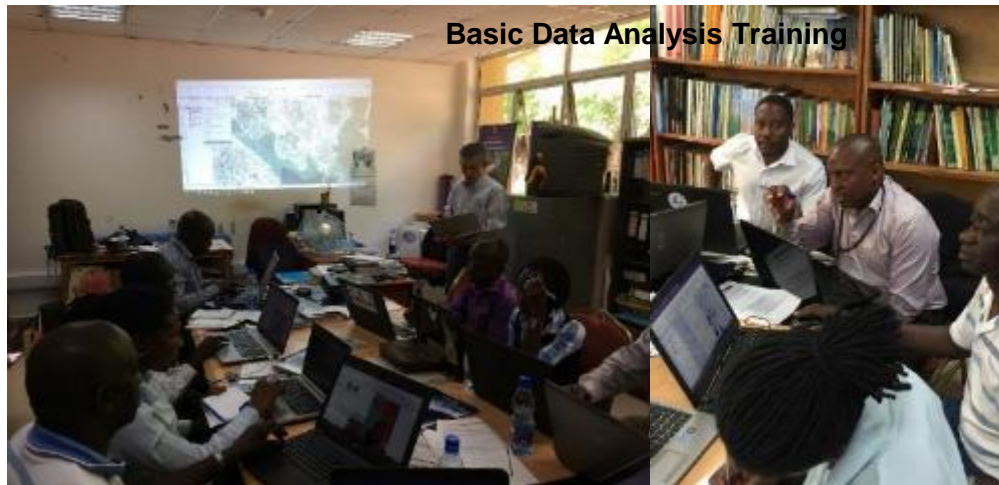
Practical Field  
Survey Training



Basic Data Analysis Training

**Object** Wetland and Peatland Monitoring  
**Location** Kampala, Uganda  
**Date** March 7, 9 & 10, 2017

- Basic Data Analysis Training with QGIS (Open & Free Software)
- Practical Field Survey Training for Deforestation



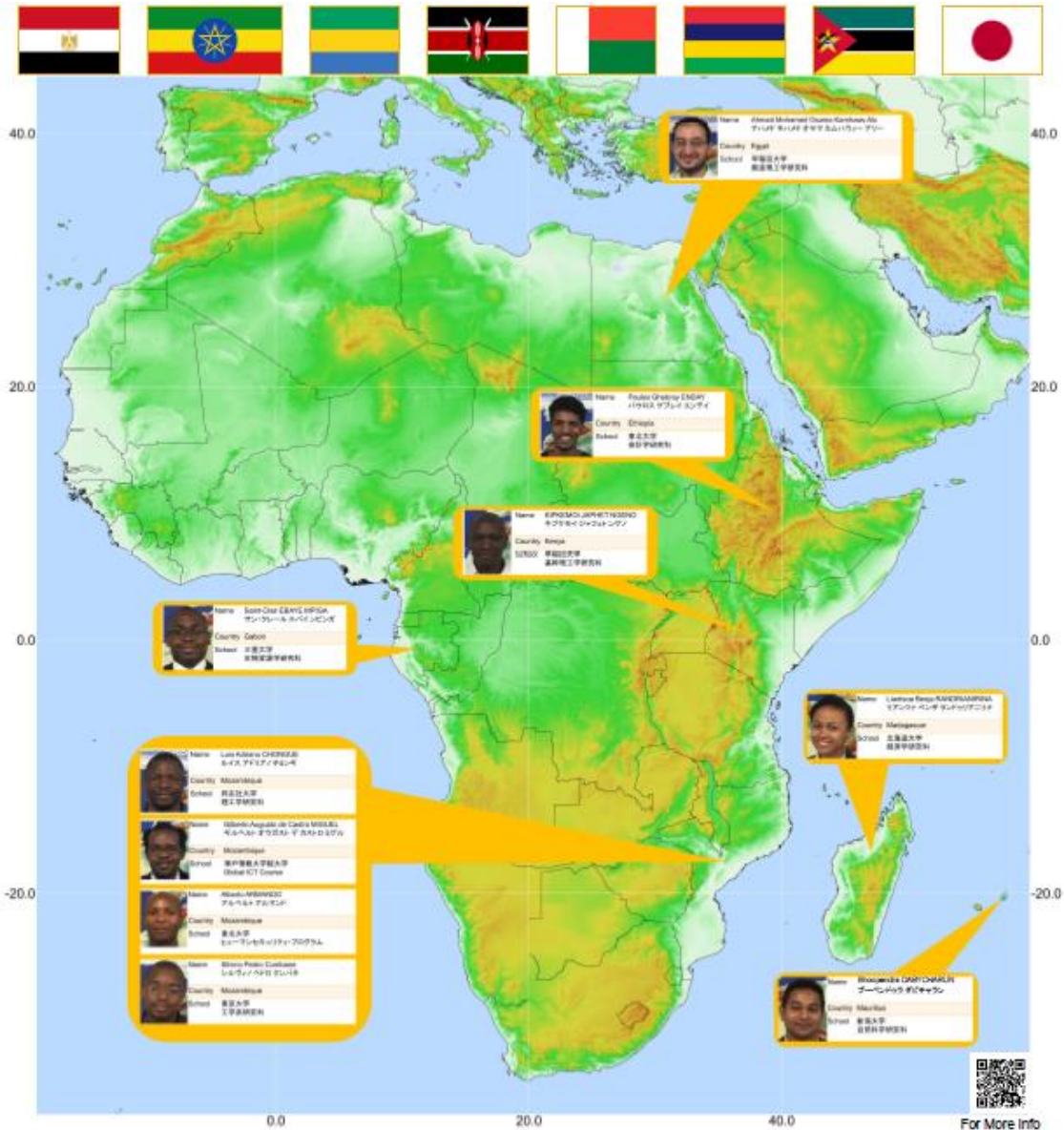
Object            Climate Change  
Location        Jakarta, Indonesia  
Date             March 12, 13 & 14, 2018









- Request from Office of the President's Special Envoy for Control Climate Change
- Basic Data Analysis and Practical Field Survey Trainings











## Master's Degree and Internship Program of African Business Education Initiative for Youth (ABE Initiative)

Prime Minister Abe announced a strategic five-year plan proving 1,000 youth in Africa with opportunities to study at Japanese schools as well as do internships at Japanese enterprises at TICAD V, 2013.



01		NAME, Country	AIME BITAKUYA HERI, DRC
		School	Nagasaki University
		Affiliation	CORDAID
02		NAME, Country	HADJER HAMAIDI, Algeria
		School	Kobe Institute of Computing
		Affiliation	Ministry of Post and ICT
03		NAME, Country	MOHAMED REDA ELSAYED MOHAMED, Egypt
		School	University of Tokyo
		Affiliation	Faculty of Engineering, Benha University
04		NAME, Country	YOHANNES TECLEMARIAM MEBRAHTU, Eritrea
		School	TUMSAT
		Affiliation	Ministry of Marine Resources
05		NAME, Country	ZO HAVANA IAGAHA JAINA RAKOTOARIVELO, Madagascar
		School	International University of Japan
		Affiliation	Centre Malgache de la Canne et du Sucre
06		NAME, Country	GLORIA SANDRINE RANDRIAMIHAJA, Madagascar
		School	Ritsumeikan University
		Affiliation	Macadam
07		NAME, Country	RADIA EL BACHA, Morocco
		School	University of Miyazaki
		Affiliation	
08		NAME, Country	BRAZAO MENDES MARIO DOMINGOS, Mozambique
		School	Ritsumeikan University
		Affiliation	National Institute for Disaster Management - North Region Directorate

09		NAME, Country	DANLAMI MOHAMMED IBRAHIM, Nigeria
		School	Shimane University
		Affiliation	F.C.T WATER BOARD ABUJA
10		NAME, Country	AMADOU FALL, Senegal
		School	University of Tsukuba
		Affiliation	Baobab Mining and Chemicals Corporation SA
11		NAME, Country	YAYI EVA MAWA UPELE, South Sudan
		School	Kobe Institute of Computing
		Affiliation	University of Juba, College of Computer Science and IT
12		NAME, Country	DAUDI TEMAELI KITUNDU, Tanzania
		School	Waseda University
		Affiliation	Giraffe Electronics and Information Systems (T) limited
13		NAME, Country	NICO ELS DE WET, South Africa
		School	Ritsumeikan University
		Affiliation	Space Commercial Services, Global Information
14		NAME, Country	MARIJA TATOMIR, South Africa
		School	International University of Japan
		Affiliation	Deloitte Consulting
15		NAME, Country	GELLY SIMAKECHULA CHIKUNI, Zambia
		School	Nagasaki University
		Affiliation	Ministry of Fisheries and Livestock
16		NAME, Country	Enkhbayasgalan DUGERJAV, Mongolia
		School	Akita University
		Affiliation	Erdenes Mongol LLC





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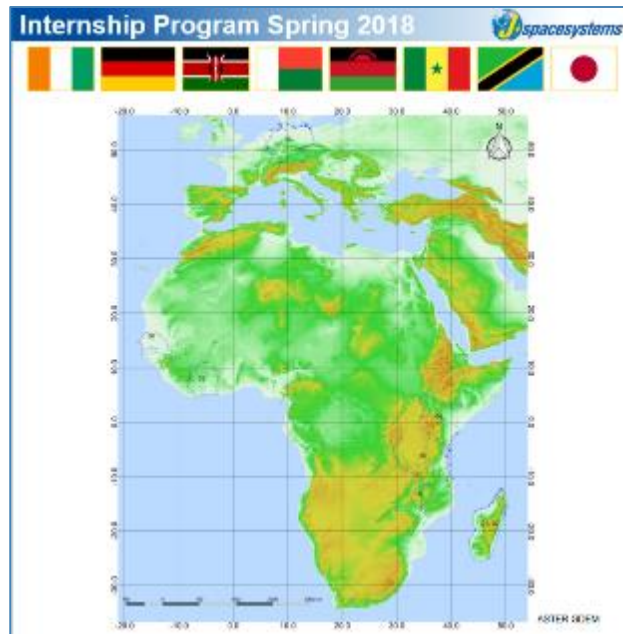
## The Kizuna Program

JICA supports sustainable mining development by implementing a long-term training in cooperation with Japanese graduate schools and companies for developing human resources. Exploration and investment in the developing countries with mineral resources by Japanese companies are boosted, contributing to mining development and at the same time a stable supply of mineral resources.



01		<b>Desire Alphonse RAKOTONDRAVALY</b> Madagascar Akita University
02		<b>Liantsoa Benja RANDRIANIRINA</b> Madagascar Hokkaido University
03		<b>Koffi Desire BROU</b> Côte d'Ivoire Hiroshima University
04		<b>Geoffrey Kibiegion RONO</b> Kenya Ashikaga Institute of Technology






























05		<b>Oswald Asaile Japhet Mulenga</b> Malawi Obihiro University of Agriculture & Veterinary Medicine
06		<b>Elhadji Ibrahima TOURE</b> Senegal Shibaura Institute of Technology
07		<b>Imani Mhembano Matula</b> Tanzania University of Miyazaki
08		<b>Lena Muhl</b> Germany Akita University



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## Participants

 Antonio MACHAVA JUNIOR Mozambique Niigata University	 Antonio MACHAVA JUNIOR Mozambique Niigata University	 Taban Alex Peter ADI South Sudan Kagawa University
 JEAN CLAUDE NIZEYIMANA Burundi Waseda University	 Cezar Martinho Agostinho Dzeca Mozambique Kyoto University	 Islam AHMADI Tunisia Tsukuba University
 GILLES NYUYKI NGORAN Cameroon Shimane University	 Gildo Guilherme DUARTE Mozambique Sophia University	 Sofiene BEN SOUISSI Tunisia Waseda University
 Kouassi Akora ATTA Côte d'Ivoire Ritsumeikan Asia Pacific Univ.	 Silvio Nelson Da Silva MACHACHANE Mozambique Sophia University	 Lotfi GUIDARA Tunisia International Univ. of Japan
 Mohamed Mahmoud Ahmed Eltaher Egypt Mie University	 Samuel Lucas LOGANIMIO Mozambique Kobe Institute of Computing	 Nanyangwe Dainess Siuluta Zambia Nagasaki University
 Sameh Hany Abdelrazek Taha Egypt Nagoya University	 Fernando Juliao Tiane Mozambique International Univ. of Japan	 Obed Chanda Zambia Kyoto University
 Eslam Ahmad Mahmoud Hamdy Ahmad Nassar Egypt Tokyo Institute of Technology	 ALU ASSAO NEINO Niger Univ. of the Ryukyus	 Jehoram Mwila Zambia Kobe Institute of Computing
 Wegahta Tesfaldet BERHE Eritrea Shimane University	 Victor Oluisedua Ifeajika Nigeria Nagaoka Univ. of Technology	 Promise Murwira Zimbabwe Kobe Institute of Computing
 Hareteke Ishmael Khalema Lesotho Ehime University	 Okechukwu Ignatius Eze Nigeria International Univ. of Japan	 Albano Michael Mahecha Tanzania Kyushu University
 EL MEHDI ER RAQABI Morocco International Univ. of Japan	 ACHILLE CLEMENT NGBOMANN MANSIS Senegal International Univ. of Japan	

28 Participants

16 Countries

1. Burundi
2. Cameroon
3. Côte d'Ivoire
4. Egypt
5. Eritrea
6. Lesotho
7. Morocco
8. Mozambique
9. Niger
10. Nigeria
11. Senegal
12. South Sudan
13. Tanzania
14. Tunisia
15. Zambia
16. Zimbabwe

Period

September 10 – 21, 2018

Conducted by  
International Cooperation Department

### Master's Degree and Internship Program of African Business Education Initiative for Youth (ABE Initiative)

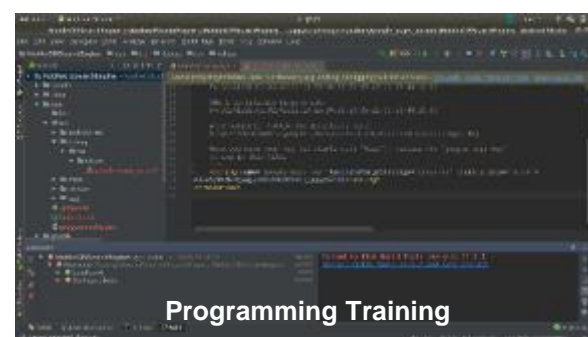
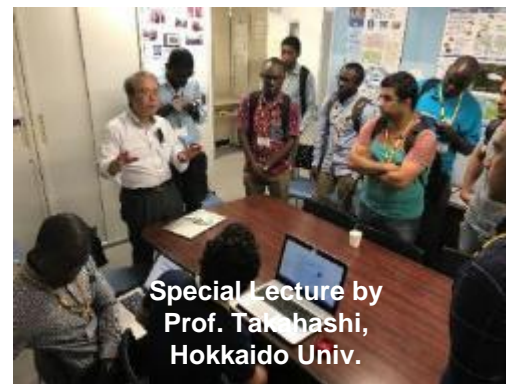
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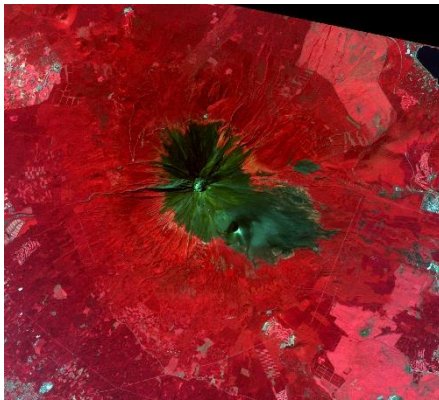
Date			Content
Sept. 10	AM	10:00 – 12:00	Introduction/Foundation
	PM	13:30 – 17:00	Basic Remote Sensing & GIS Training
Sept. 11	AM	10:00 – 12:00	Basic Remote Sensing & GIS Training
	PM	13:30 – 17:00	Field Survey Training & <b>Special Lecture from Prof. Takahashi, Hokkaido Univ.</b>
Sept. 12	AM	10:00 – 12:00	Basic Remote Sensing & GIS Training
	PM	13:30 – 17:00	Remote Sensing & GIS Course/System Development Course
Sept. 13	AM	10:00 – 12:00	Remote Sensing & GIS Course/System Development Course
	PM	13:30 – 17:00	Remote Sensing & GIS Course/System Development Course
Sept. 14	AM	10:00 – 12:00	Preparation for Field Trip <b>11:00 Business Networking w/ Asia Air Survey</b>
	PM	13:30 – 17:00	<b>15:00 Business Networking w/ At Vision</b> Mid-term Report
Sept. 15	ALL	08:00 – 17:00	Special Filed Trip (Mt. Hakone)
Sept. 17	AM	10:00 – 12:00	Individual Case Study (Optional)
	PM	13:30 – 17:00	Individual Case Study (Optional)
Sept. 18	AM	10:00 – 12:00	Ideathon
	PM	13:30 – 17:00	Remote Sensing & GIS Course/System Development Course
Sept. 19	AM	10:00 – 12:00	Remote Sensing & GIS Course/System Development Course
	PM	13:30 – 17:00	<b>13:45 Business Networking w/ M.S.K.</b> <b>15:00 Business Networking w/ Mitsubishi Material Techno</b>
Sept. 20	AM	10:00 – 12:00	<b>10:00 Business Networking w/ Nippon Light Metal Company</b>
	PM	13:30 – 17:00	<b>14:00 Business Networking w/ Marubeni</b> <b>15:30 Business Networking w/ IHI Aerospace</b>
Sept. 21	AM	10:00 – 12:00	<b>11:00 Business Networking Visiting to JOGMEC</b>
	PM	13:30 – 17:00	Final Presentation (13:30 – 16:00)/Farewell Party (17:00 - )

- 2-week Course
- Basic Remote Sensing Training
- Individual Case Study for Solving Faced Issues
- Practical Field Survey in Hakone
- Ideathon (Group Work)
- Business Networking



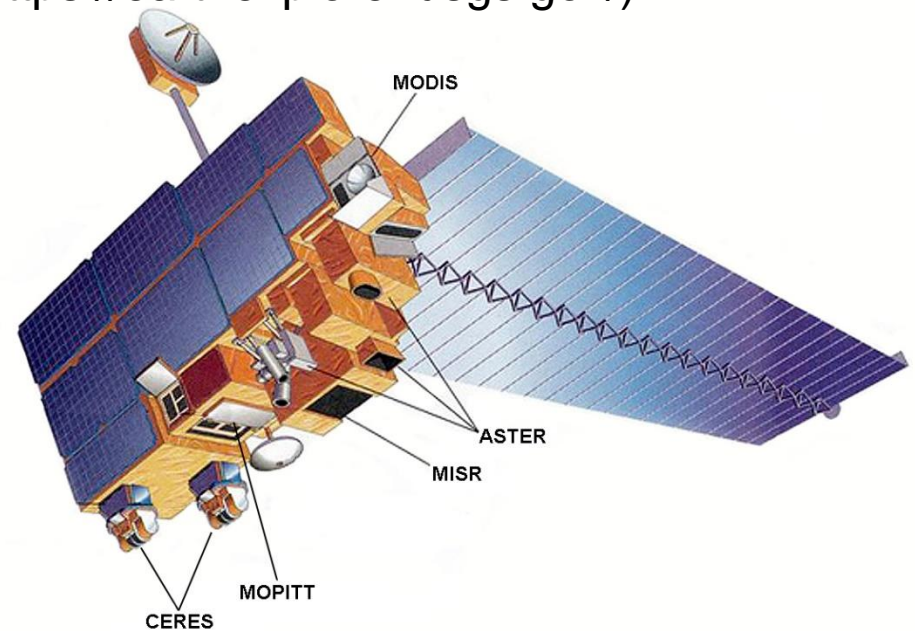
## ➤ ASTER

- Advanced Spaceborne Thermal Emission and Reflection Radiometer
- Developed by METI
- Launched in 1999
- Operating until nowadays
- Long-term Earth Observation over 19-year (500-600 scenes/day)
- Cooperation with NASA
- ASTER GDEM also available (<https://earthexplorer.usgs.gov/>)



**Mt. Fuji**  
**ASTER Data Belongs to METI/NASA**

ASTER Data Available on MADAS  
FREE OF CHARGE  
(<https://gbank.gsj.jp/madas/>)



**ASTER/Terra**  
**© NASA**

- **FIELDNAUT**
  - Android App for Field Survey
  - Simple Usage
  - Output File Set for Data Analysis
  - Data Sharing with Own Data Server

- **GIS Data Sharing System (GDSS)**
  - WebGIS on 1 Desktop PC
  - Simple Operation
  - Operation with FIELDNAUT  
→ Effective Data Utilization

**FIELDNAUT Available on Google Play  
Install Now!**



**FIELDNAUT** is Android App. It plots your location on satellite data, basic and thematic maps by GPS, Camera and Text Functions. You can compare local information and satellite data in real-time. FIELDNAUT makes your survey improved drastically! Free Version released in July, 2018! Try now!

**Simple**  
You can use intuitively.

**Data Share**  
You can share data files on not only email, but also Google Drive, Facebook, and other SNS sites.

**Output Data**  
FIELDNAUT provides data files for GIS data analysis.  
• GPS (Tracks)  
• ARI (Tracks)  
• CSV (Coordinates or Name & Photo File Names)  
• JPEG (Photos Files)

**High Scalability**  
Customized versions available!  
• Additional Map Layers  
• Add and/or Edit Output Data Files  
• Collaborative or Your Special View-GIS

**Not Only for Survey Projects**  
You can use FIELDNAUT anywhere, any time for any purposes!  
• Field Survey  
• Management for Forest & Agriculture  
• Monitoring  
• Daily Activities, Jogging, Drives  
• Skiing, Street Viewing, etc.

**International Cooperation**  
Japan Space Systems works for Global Issues through international cooperation and capacity building. FIELDNAUT was installed into these activities.

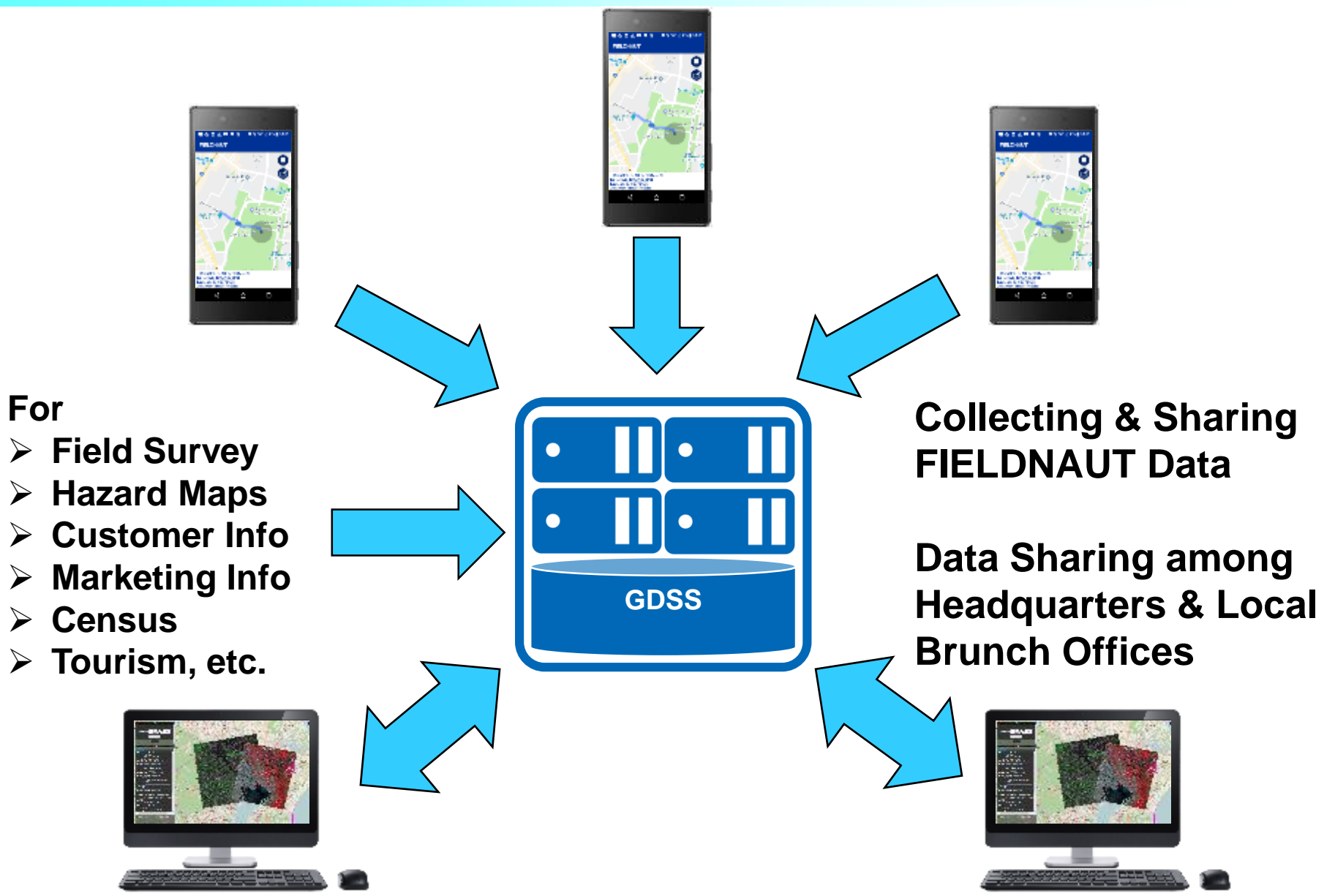
**Projects (In Progress)**  
• Environmental Assessment in Zambia (UNCAUST 04/2015-2016 - )  
• Sustainable Resource Development in Zambia (UNCAUST 04/2015-2016 - )

**Project in Serbia (2015 - )**  
• Environmental issues by natural resource developments are serious globally. This project we develop recycling technologies. Also we take field survey and use satellite data and GIS data for environmental assessment.  
• We take field survey with counterparts, and provide technical transfer through GIS data analysis training.

**Project in Zambia (2016 - )**  
• Climate-resilient by natural resource development is serious issue in Zambia. This project, we assess social impacts through recognizing an local (P/C) sustainable mechanism.  
• We research on P/C contribution through field survey and satellite and GIS data analysis. We provide 3-day GIS training at University of Zambia.

**Project in Uganda (2017)**  
• Hybrid development and degradation are serious issues in Uganda because of agricultural development through increasing population. Balance between wetland system restoration and development is important for sustainable development.  
• Availability of Water and Environment of Uganda wet on a local and we visited. We had 3-day GIS training there. We also had field survey for understanding wetland current situation in Uganda.

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## Capacity Building Programs



ABE Initiative Internship 2016



ABE Initiative Internship 2018



Capacity Building in Uganda



Capacity Building in Peru



ABE Initiative Internship 2017



In-Japan Capacity Building



Capacity Building in Japan



Capacity Building in Indonesia