

**CHALLENGING SPACE SMART**

UN Symposium to Strengthen the Partnership with Industry Nurturing  
the Development of Space Technology

# Trend of Small EO Satellites and Their Applications



For further information,  
Phone: +82 42 365 7506  
Fax: +82 42 365 7549  
E-mail: [hschang@satreci.com](mailto:hschang@satreci.com)  
URL: [www.satreci.com](http://www.satreci.com)  
461-26 Jeonmin-dong Yusung-gu, Daejeon, 305-811, Korea

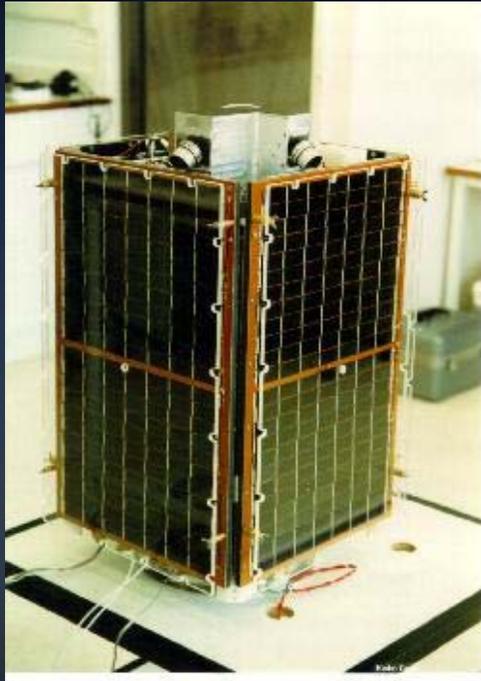
## • Conventional Satellite

- Generally available only to developed countries in space

## • Small Satellite

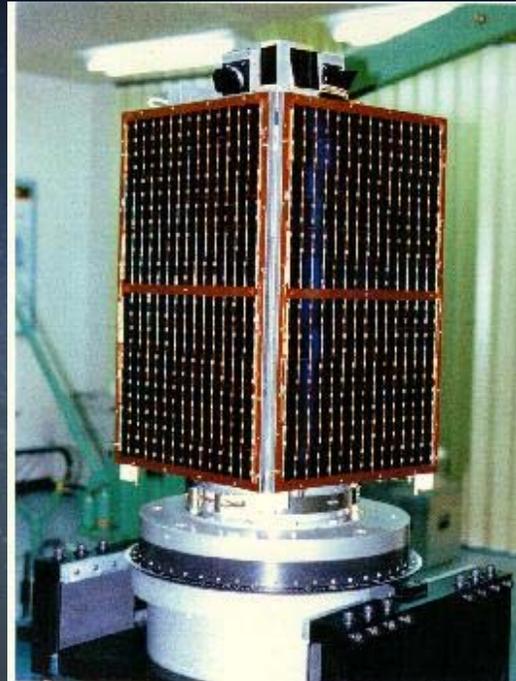
- A feasible tool to access space for emerging countries
- Korea started space development with a small satellite program by the university, KAIST, 20 years ago.

# KITSAT Series



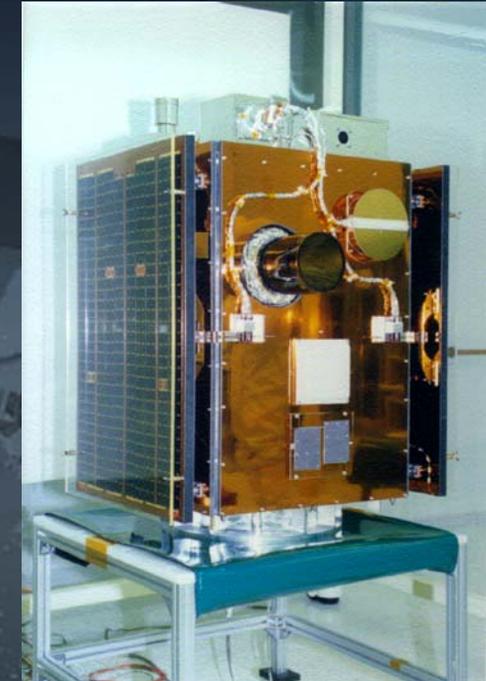
**KITSAT-1 (1992)**

- Technology Acquisition
- Manpower Training
- Jointly Developed with the University of Surrey, UK



**KITSAT-2 (1993)**

- Technology Verification
- New Payloads
- Use of Korean Components
- Developed by KAIST and Tested in Korea



**KITSAT-3 (1999)**

- Development of a Unique Small Satellite System
- Engineering Test for Key Technologies
- Advanced Payloads

# KITSAT-3 Image - Singapore



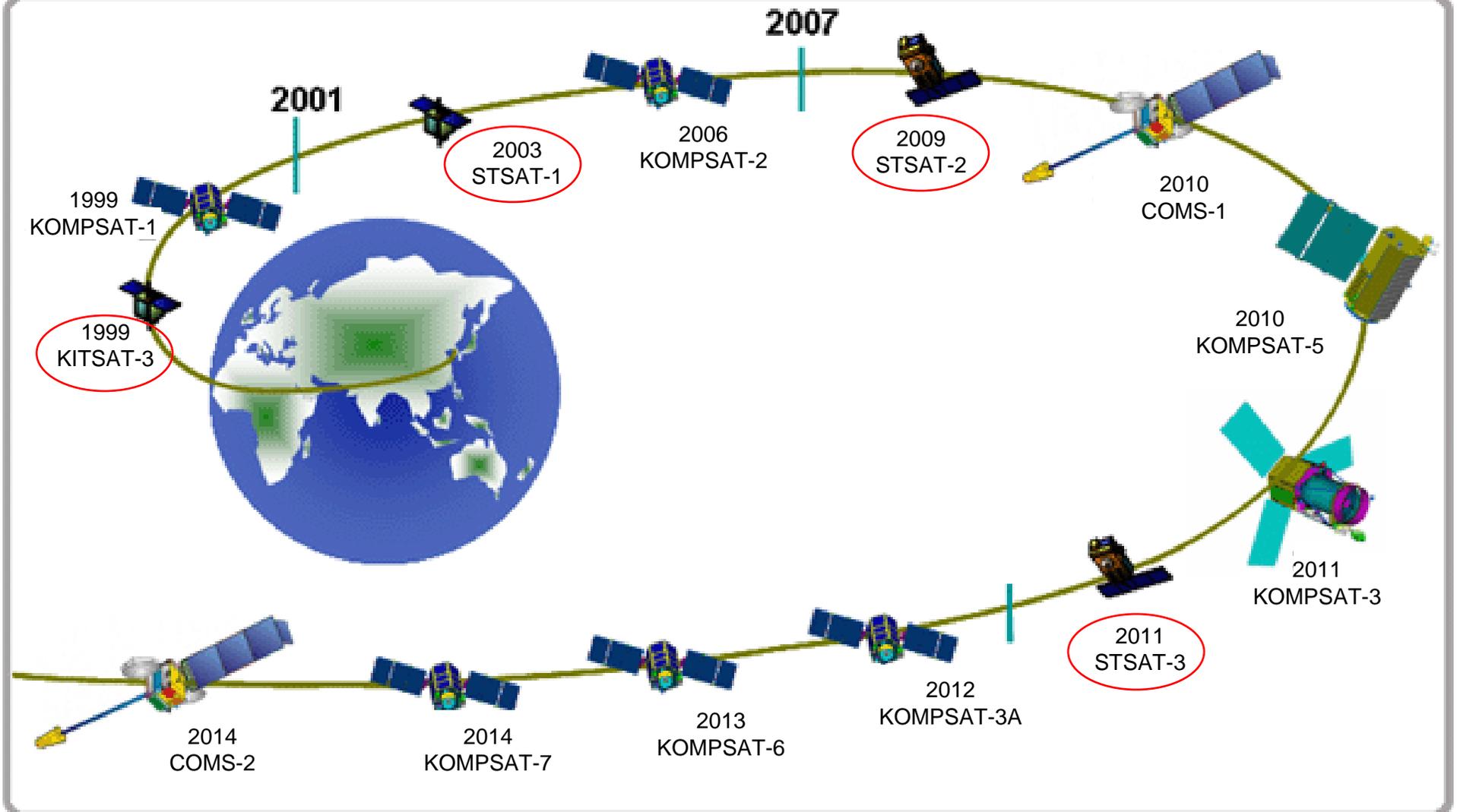
# KITSAT-3 Image – Cairo

360 km

50 km



# National Satellite Development Plan in Korea



# Satrec Initiative (SI)



Spin-off Venture Company from KAIST for the commercialization of space technology

Founded in December 1999

Over 130 Full-time Staffs

Located in Daedeok Science Town, Daejeon, Korea

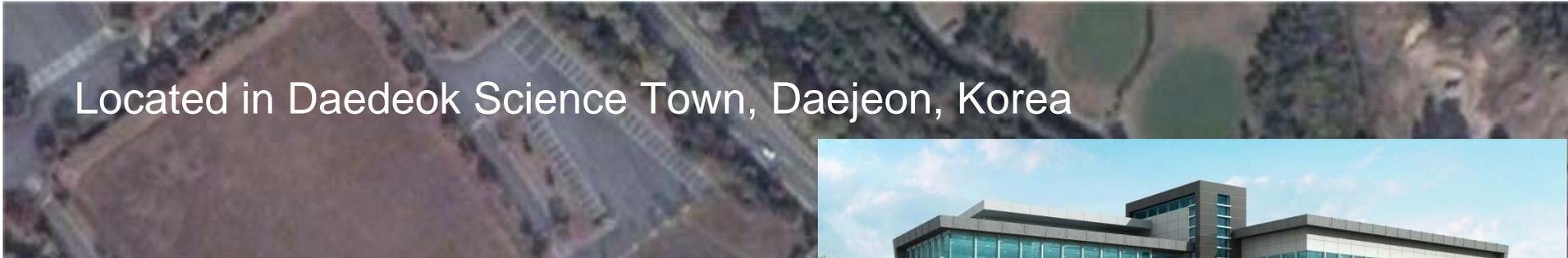
Main Business Area : Space Systems and Its Spin-off Products



CHALLENGING SPACE SMART



Located in Daedeok Science Town, Daejeon, Korea



## Total Solution Provider for Earth Observation Missions

Defense

Spin-off

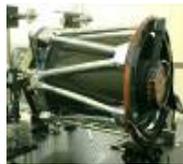


### Satellite Platform



- Spacecraft Bus
- Aerospace Component

### Payload



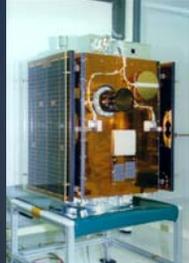
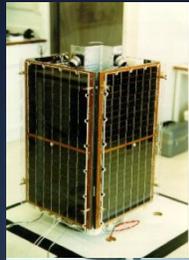
- Electro-Optical Payload
- SAR Payload
- Communications Transponder
- Space Science Instrument

### Ground Station



- Mission Control Station
- Satellite Image Receiving & Processing Station

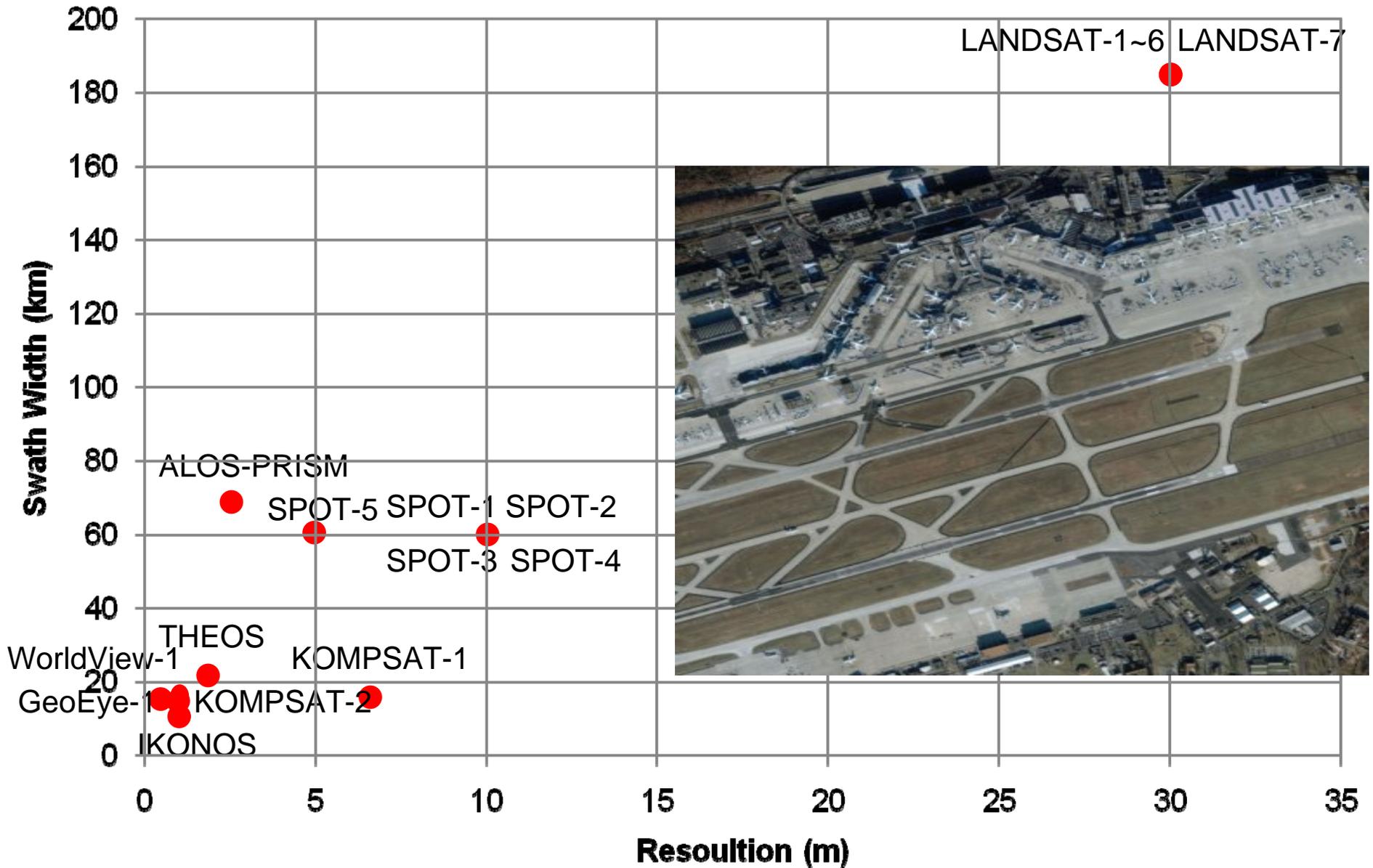
# Experiences



- 20 Years Space Experience
- Over 20 International & National Space Programs
- Partners from Asia, Middle East and Europe



# Conventional Satellite (> 500 kg) Trend



# Remote Sensing (Earth Observation)

## • International Activity

- Initially available only to 'super powers', then to wealthy nations

## • From the 80s,

- High resolution satellite imageries were commercially available
- 10 m resolution images were dominant in the market

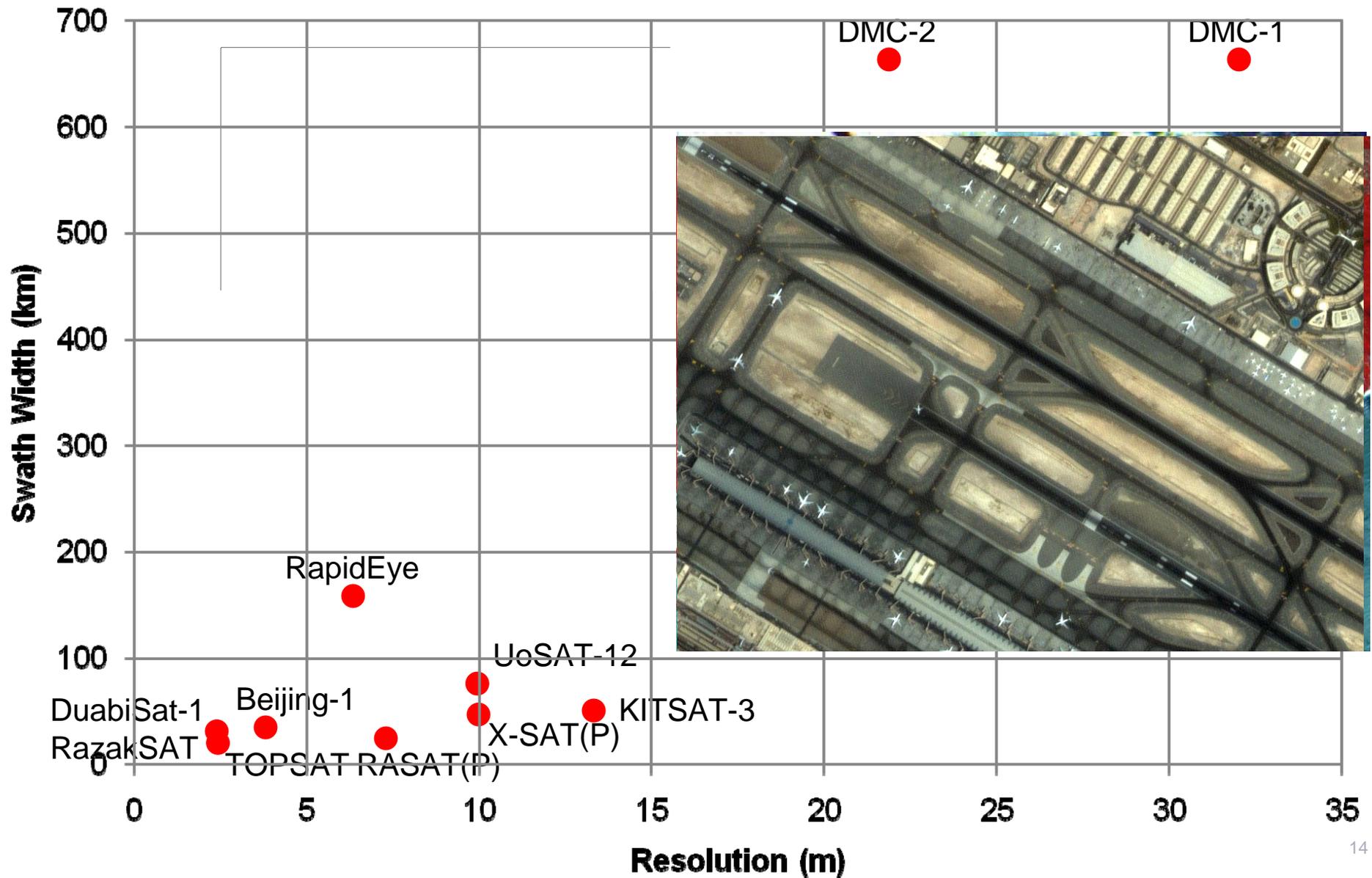
## • From the late 90s,

- 1 m resolution satellite imageries appeared
- Currently sub-meter class imageries available as well as moderate resolution with wider swath width

## • Conventional EO Satellites

- Built by wealthy nations due to extremely high cost

# Small Satellite (< 500 kg) Trend



- **From the Early 90s,**

- Small satellite manufacturers started Earth observation missions
- The image qualities were not good enough for remote sensing applications.

- **From the late 90s,**

- Useful quality of 10 m resolution images were generated

- **Currently,**

- High performance small satellites that can generate up to 2.5 m resolution images are available.

- **Small EO satellites**

- Developed with very low budget compared to conventional ones

# Small EO Satellite Applications

- Urban Planning
- Disaster Monitoring
- Land Management
- Seashore Monitoring
- Crop Management
- Many More...



# Future Trend Expected

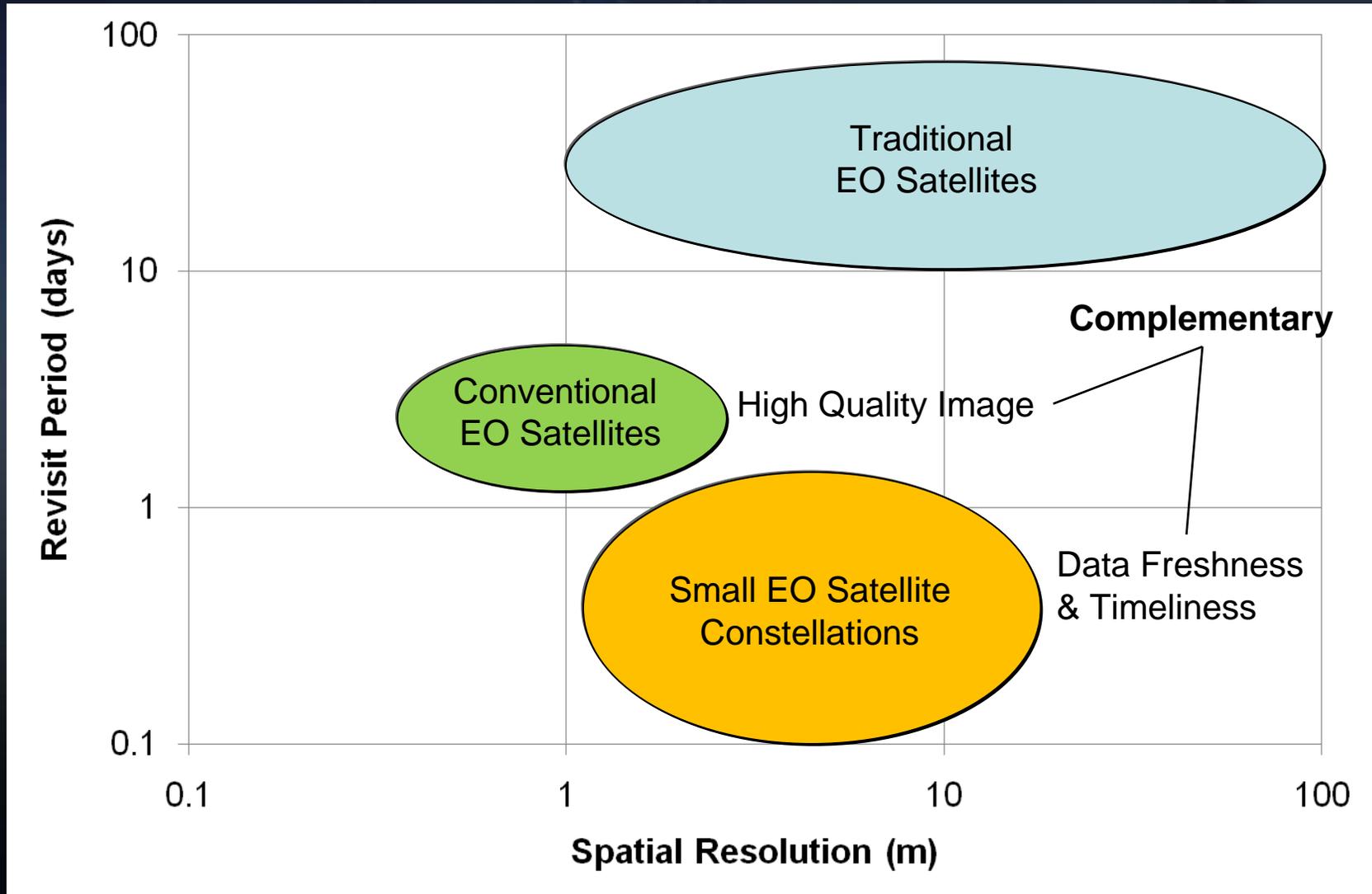
## • Demand for High Resolution Images ↑

- To see the details
- Limited spectral channel

## • Demand for Wide Swath ↑

- Due to frequent natural disaster.
- Various spectral channels

# Conventional and Small Satellites



## • Sustainable Space Program

- **Continuous support from government**
  - Political and social recognition
  - Mission should be accepted beneficial to the people
- **Technology acquisition**
  - Mission considering requirements & constraints

**A high performance and cost effective small Earth observation mission can be a good candidate**

# Concerns of Emerging Countries

- **Keeping the Trained Manpower after the 1st program**
  - Approval of mid- & long-term space development plan
  - Let the team busy with satellite development
  - Make the team proud of themselves

# Suggestion to Emerging Countries

## • 1st Phase: Technology Acquisition

- Acquire technology through joint satellite development with an experienced partner
- Manpower buildup

## • 2nd Phase: Technology Verification & Enhancement

- Lead satellite development & enhancement

## • 3rd Phase: Indigenous Model Development

- Indigenous model development for future missions

## • Space: Precious Asset

- To be developed peacefully for the progress of humanity & accessible by all

## • Space Development: International Activity

- To be performed for the benefit of all nations
- More number of active international cooperation anticipated