Institute of Remote Sensing and Digital Earth
Chinese Academy of Sciences

CAS-TWAS Centre of Excellence on Space Technology for Disaster Mitigation

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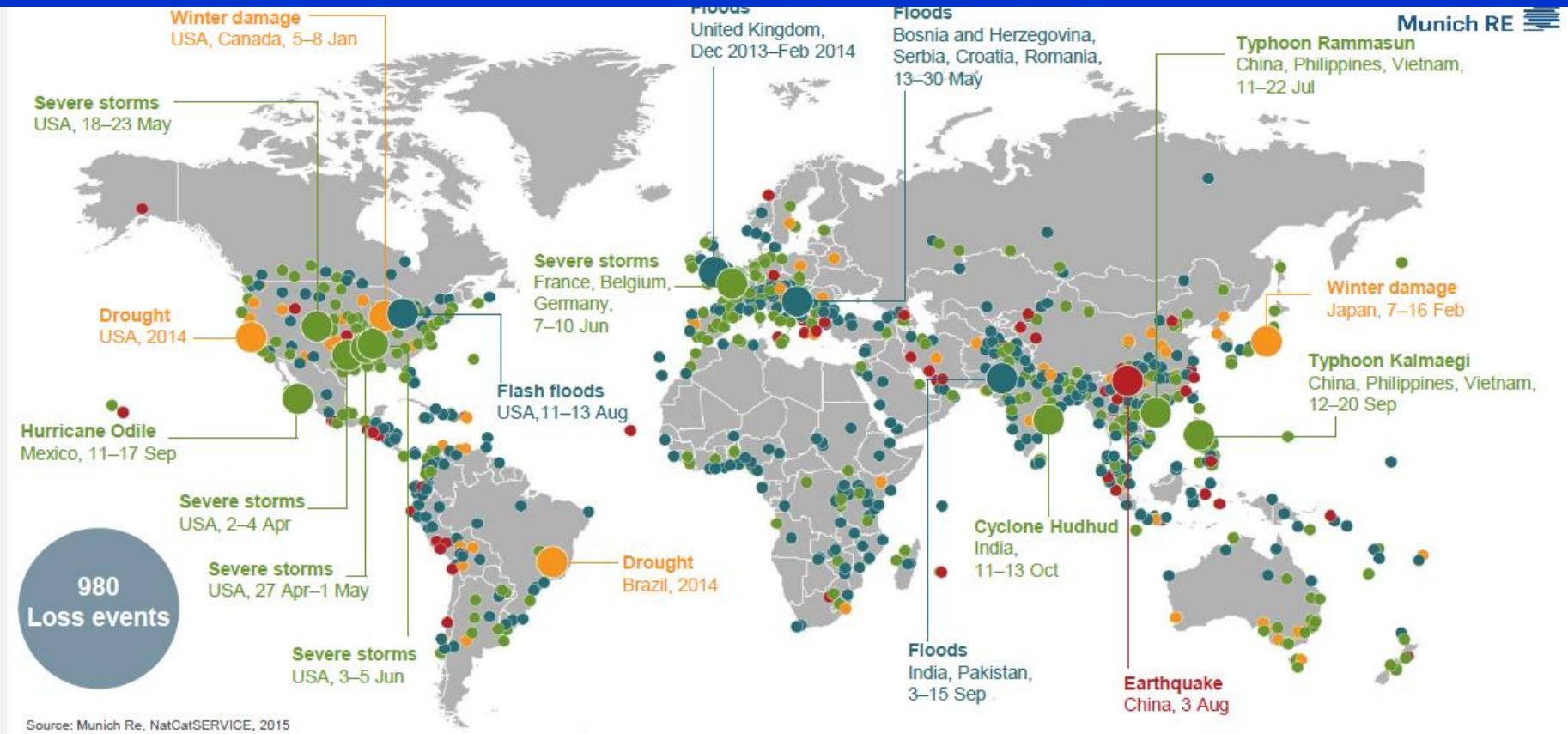
June 3, 2015 Qingdao, China

Natural Hazards in 2014

We are facing the severe disaster challenges



- Loss events
- Selection of catastrophes
  Overall losses ≥ US$ 1,500m
- Geophysical events
  (Earthquake, tsunami, volcanic activity)
- Meteorological events
  (Tropical storm, extratropical storm, convective storm, local storm)
- Hydrological events
  (Flood, mass movement)
- Climatological events
  (Extreme temperature, drought, wildfire)

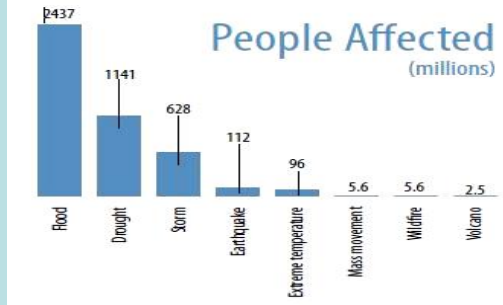
Source: Munich RE

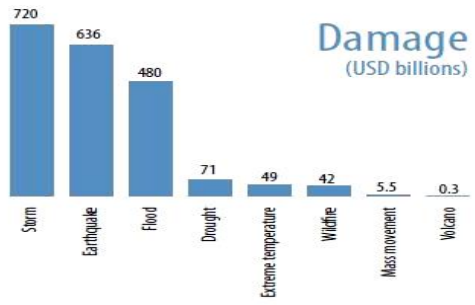
Impacts of Natural Disasters (1992-2012)

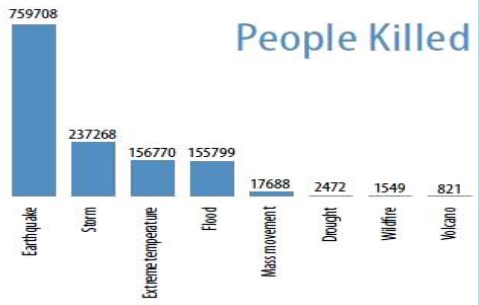
Affected
4.4 Bln.
About 64% of the Earth population

Damage
$ 2.0 Tln.

Killed
1.3 Mil.
Comparable to the number of victims in 1500 A380 (853 passengers each) accidents







TOP 10 COUNTRIES IMPACTED BY DISASTERS

China
2.5 BILLION
people affected

India	928 million
Bangladesh	136 million
Philippines	92 million
Thailand	72 million
Pakistan	64 million
Ethiopia	46 million
Kenya	44 million
Iran Islam Rep	40 million
Viet Nam	39 million

USA
560 BILLION
in damage (USD)

Japan	402 billion
China P Rep	331 billion
Thailand	45 billion
India	43 billion
Italy	36 billion
Germany	31 billion
France	31 billion
Chile	31 billion
Australia	28 billion

Haiti
230675
people killed

Indonesia	185152
Myanmar	139351
China P Rep	128298
India	103182
Pakistan	85332
Russia	61152
Sri Lanka	36000
Iran Islam Rep	32680
Venezuela	30463

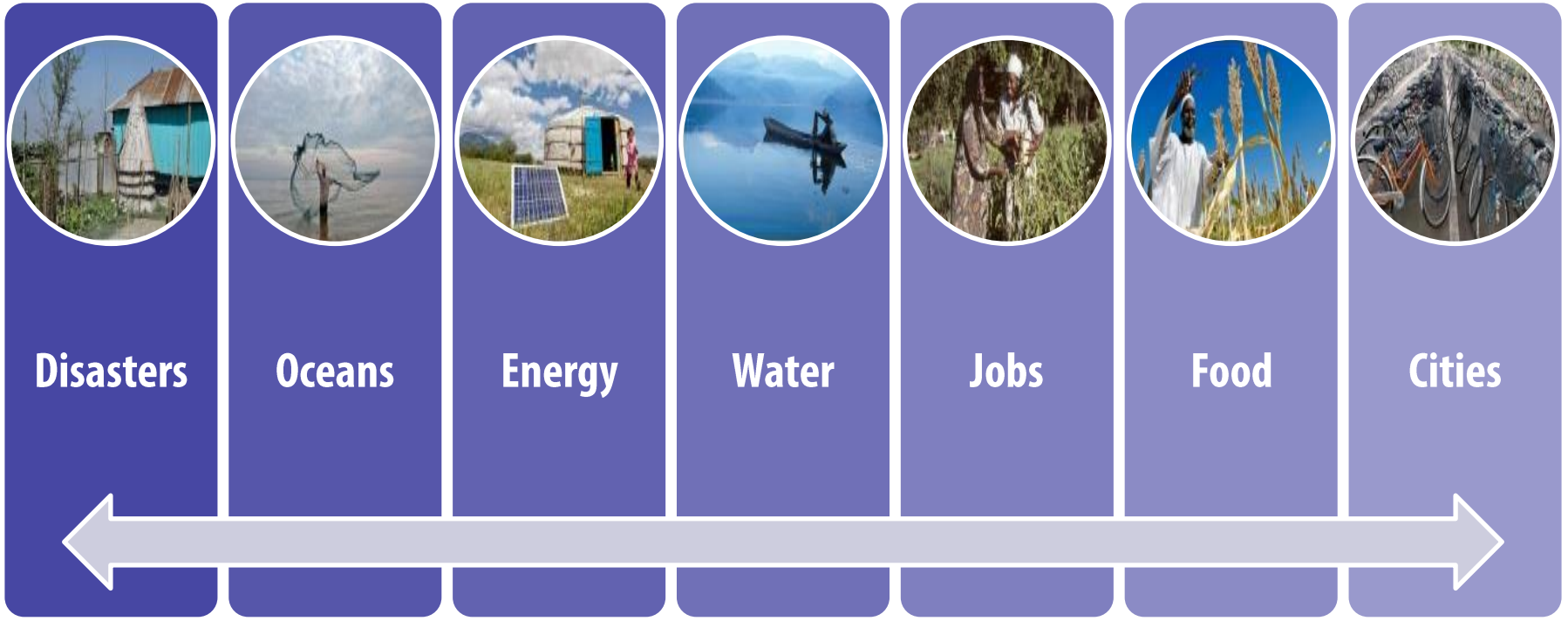
Source: UNISDR report of June 13, 2012

Disaster Mitigation for Sustainable Development

RIO+20
United Nations Conference on Sustainable Development

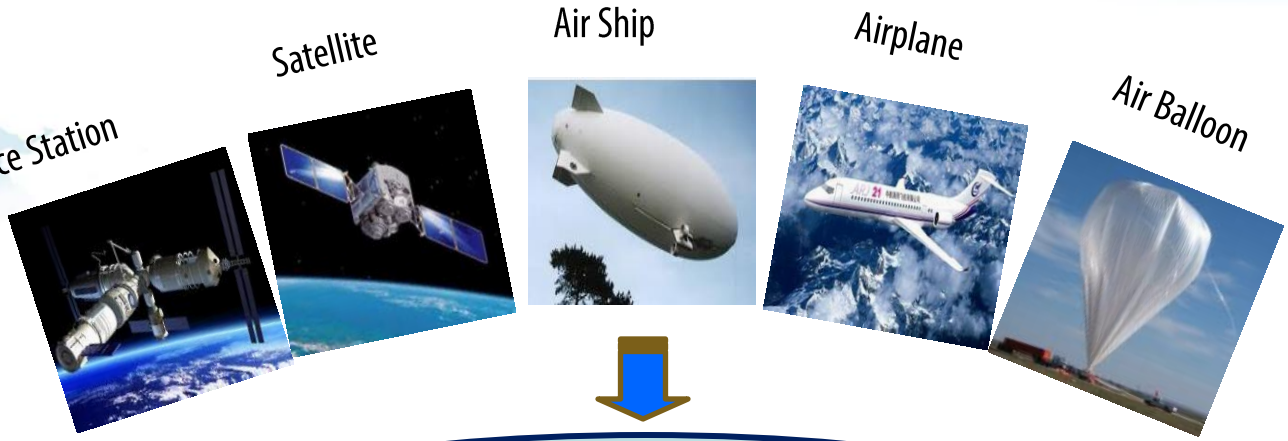
Rio de Janeiro, Brazil, June *20*-22, 2012

7 critical issues for sustainable development



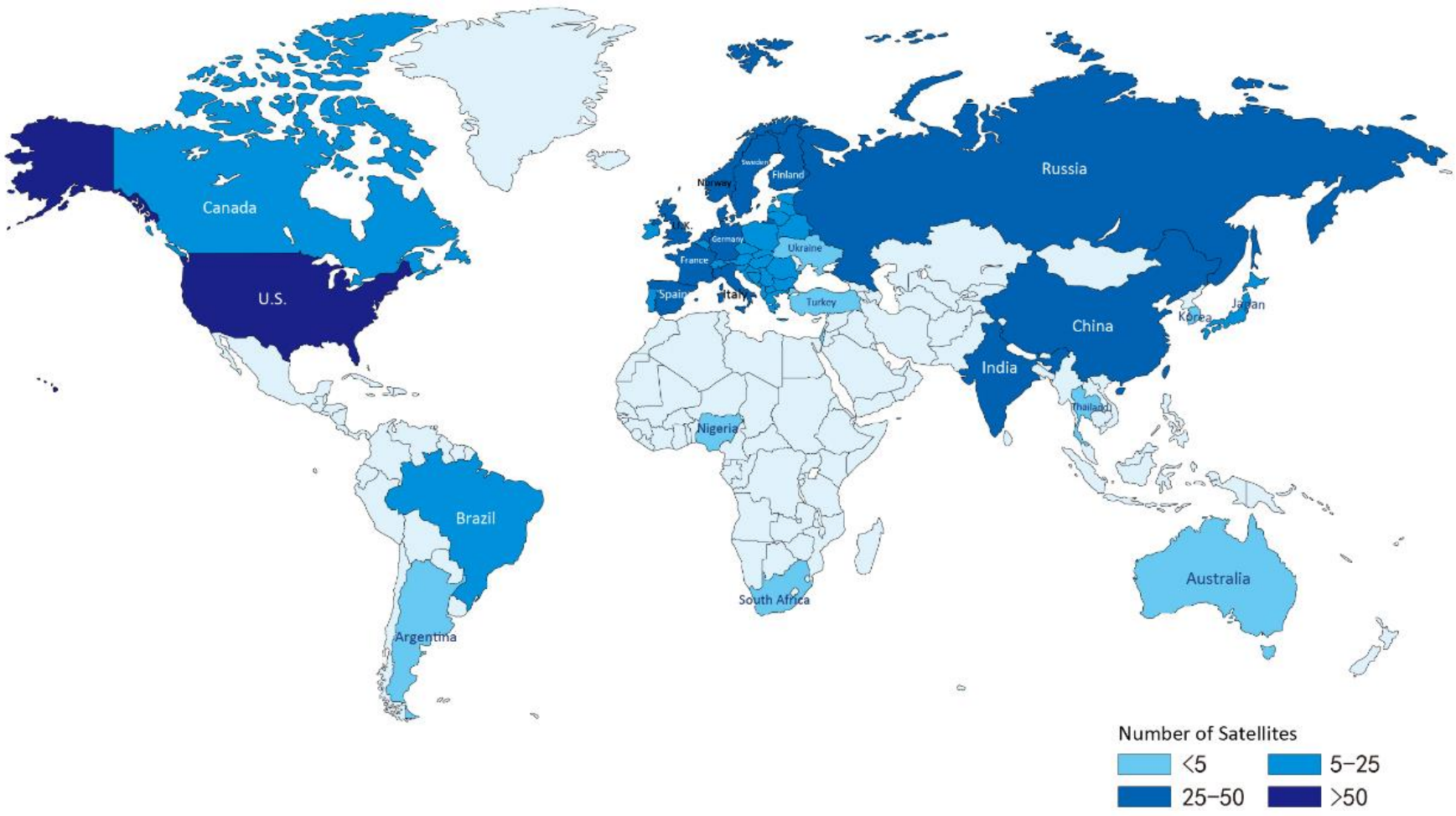
Source: Rio+20 Conference Website

EO for Disaster Mitigation



Earth Observation Systems

Earth Observation Missions
(1962-2012)

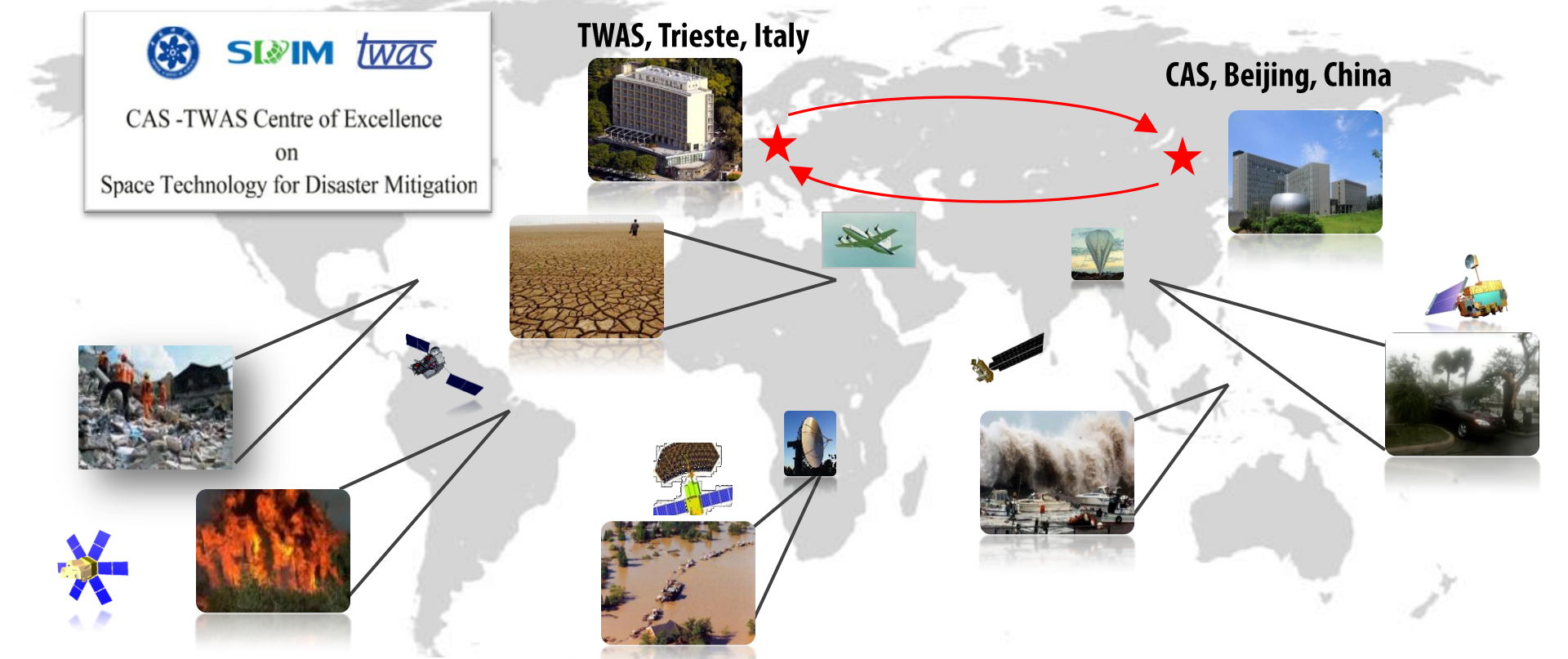


Data from CEOS EO HANDBOOK 2012

CAS-TWAS Centre of Excellence on Space Technology for Disaster Mitigation(SDIM)

CAS-TWAS CoE SDIM aims to enhance scientific and research capacities for **disaster mitigation** in **developing countries** through the use of the most advanced **space technologies.** The centre is **hosted at RADI, CAS.**

Joint Research Program ***Education & Training Workshop*** ***Scientific Report & Advisory Services*** ***Conference & Seminar***



Host Institute

Institute of Remote Sensing and Digital Earth (RADI)

Mission & Focus Areas

Main Areas of Focus

Earthquakes

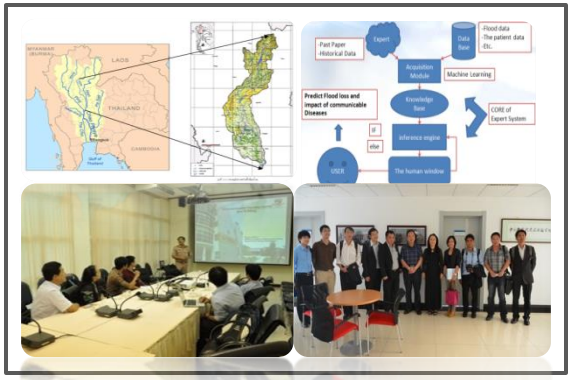


Droughts


Floods


Progress Summary

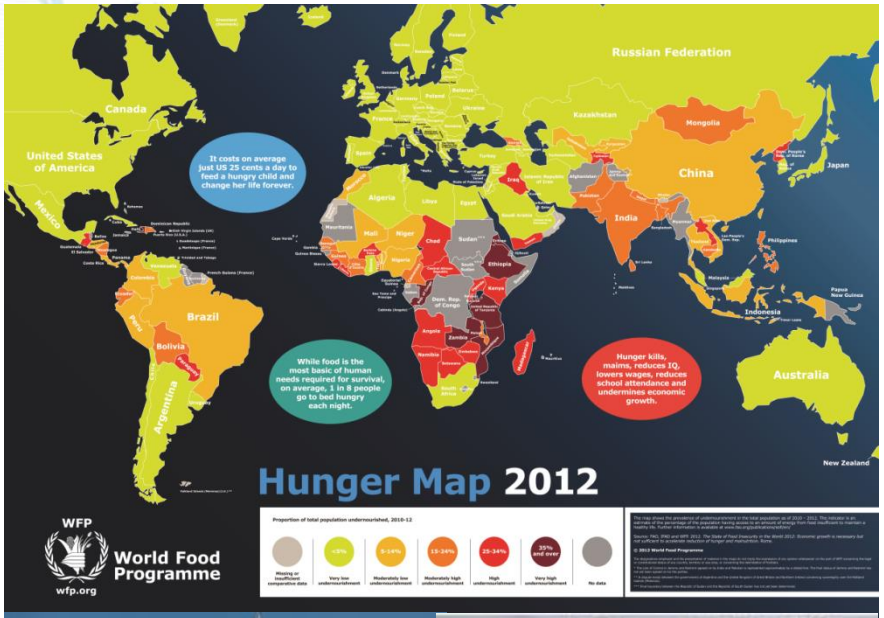
- **11** research projects are launched cooperating with 13 developing countries
- **4** key application systems are developed and transferred
- **4** training workshops and **1** strategy report
- **15** students and scholars study at SDIM



SDIM GISTDA BRAC UNIVERSITY Pakistan Meteorological Department Government of Pakistan ЦАИИЗ www.radi.cc

1.CropWatch System

Food: a big issue for current and the future



All major food producers and consumers crucially depend on **timely and accurate information on food production**, especially in developing countries.

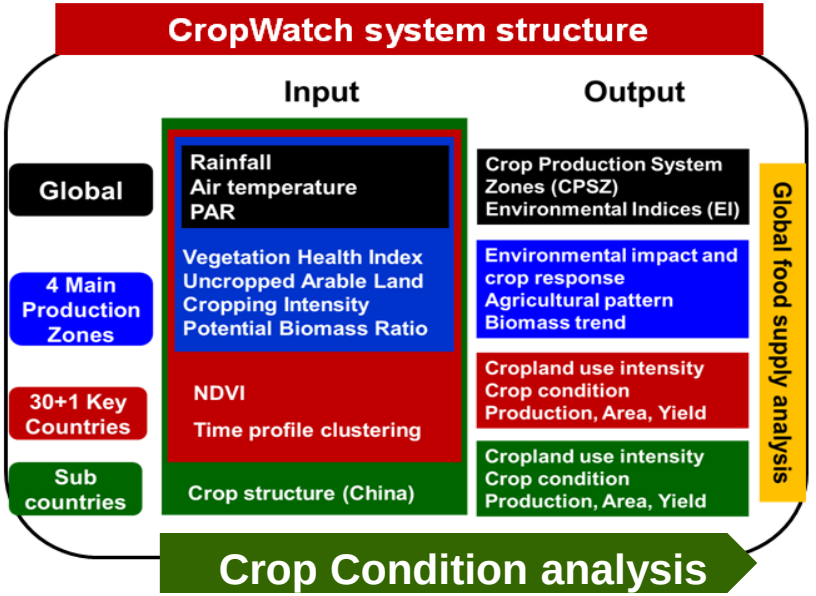
Disaster : threats to world food security

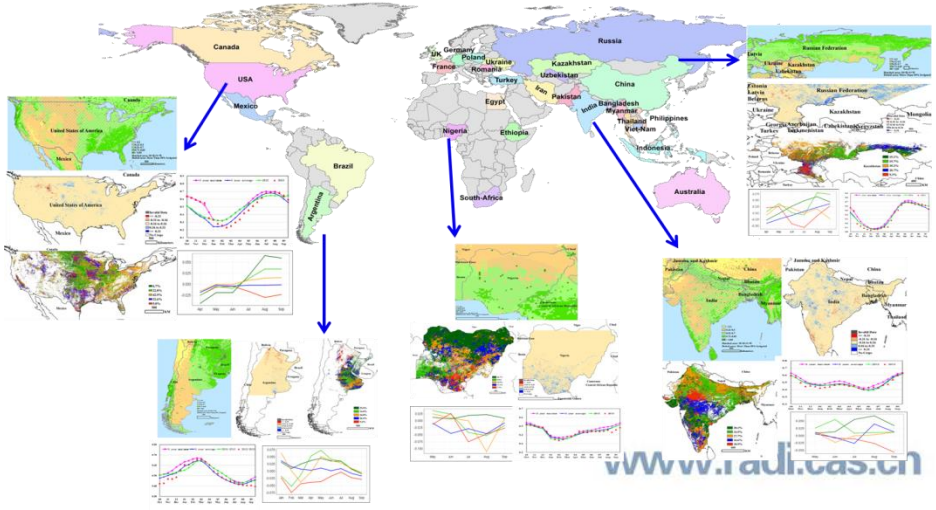
1.CropWatch System

Monitoring the food security using remote sensing

CropWatch® Components

- Drought Condition
- Crop growth Condition
- Crop Production Prediction
- Grain Production Estimation
- Crop Planting Structure Inventory
- Cropping Index
- Grain Supply-Demand Balance and Early-warning

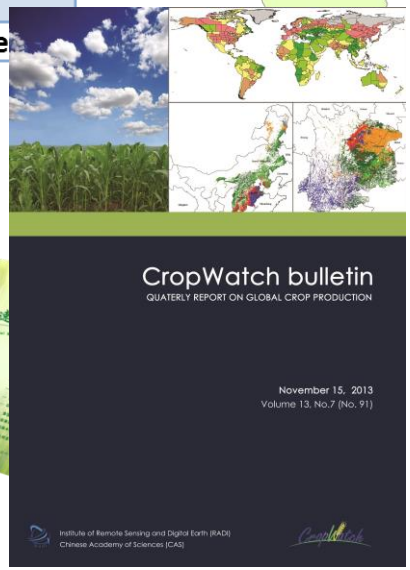




1.CropWatch System

CropWatch bulletin is published four times a year

Wheat	Maize	Rice	Soybean
China	United States	China	United States
India	China	India	Brazil
Russia	Brazil	Indonesia	Argentina
United States	Argentina	Bangladesh	China
France	Ukraine	Vietnam	
Australia	India	Thailand	
Canada	Mexico	Myanmar	
Pakistan	Indonesia	Philippines	
Germany	France	Brazil	
Kazakhstan	Romania	Cambodia	
Ukraine	Canada	Pakistan	
Turkey	South Africa	United State	
Argentina	Nigeria		
United Kingdom	Ethiopia		
Iran			
Poland			
Egypt			
Uzbekistan			
Brazil			



CropWatch Bulletin

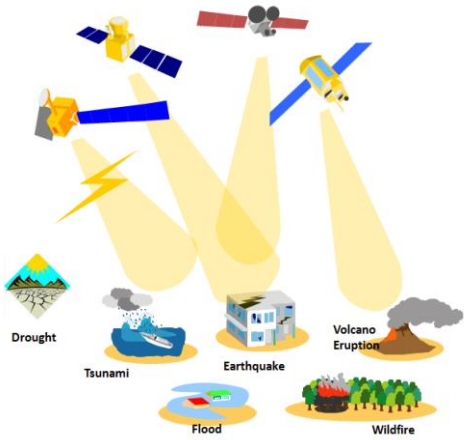
The bulletin provides a comprehensive overview of the global production of ***wheat, rice, maize, and soybean*** which can **guide decision-making and boost food security**.

http://www.cropwatch.com.cn

www.radi.cas.cn

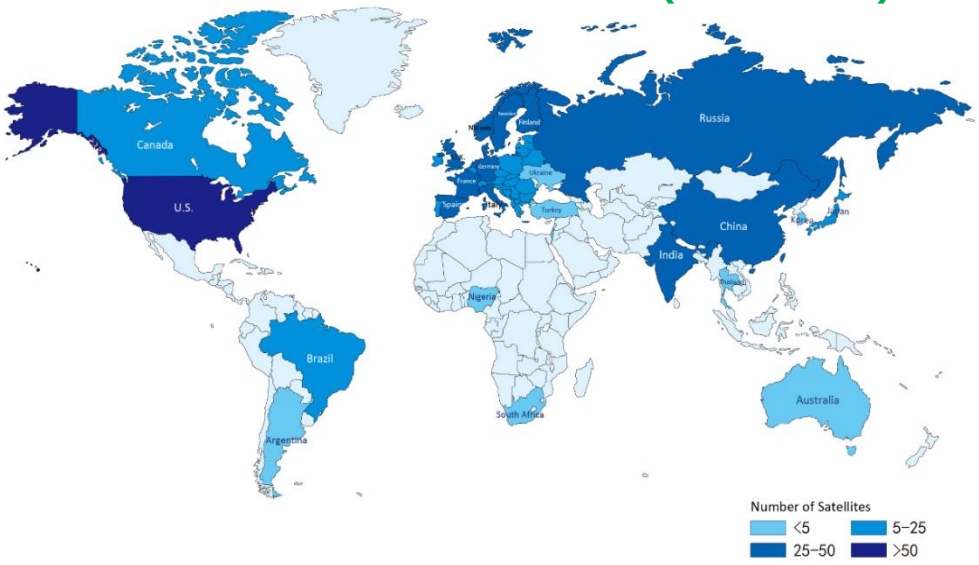
2.SatSee Technology

Earth observation is a **powerful** technology for **disaster mitigation**



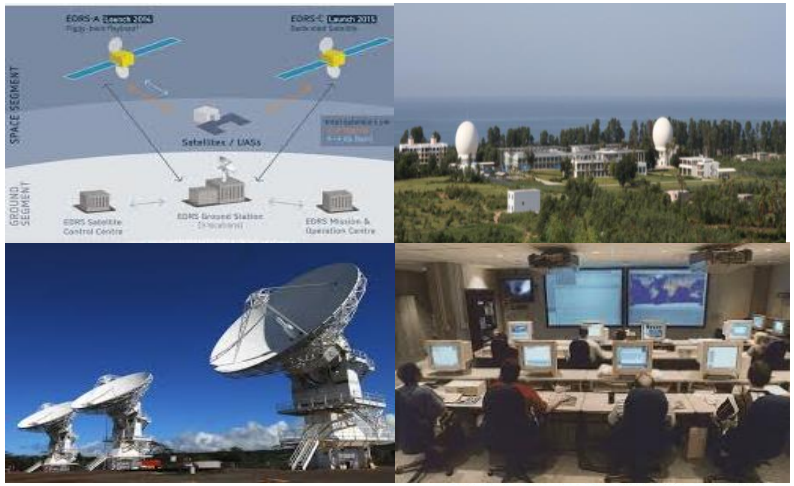
For disaster quick response and management, developing countries are seeking to **increase their level of Earth observation data sharing**.

Earth Observation Missions (1962-2012)



Very few developing countries launched satellites

High cost of the construction of a new satellite ground station



2.SatSee Technology

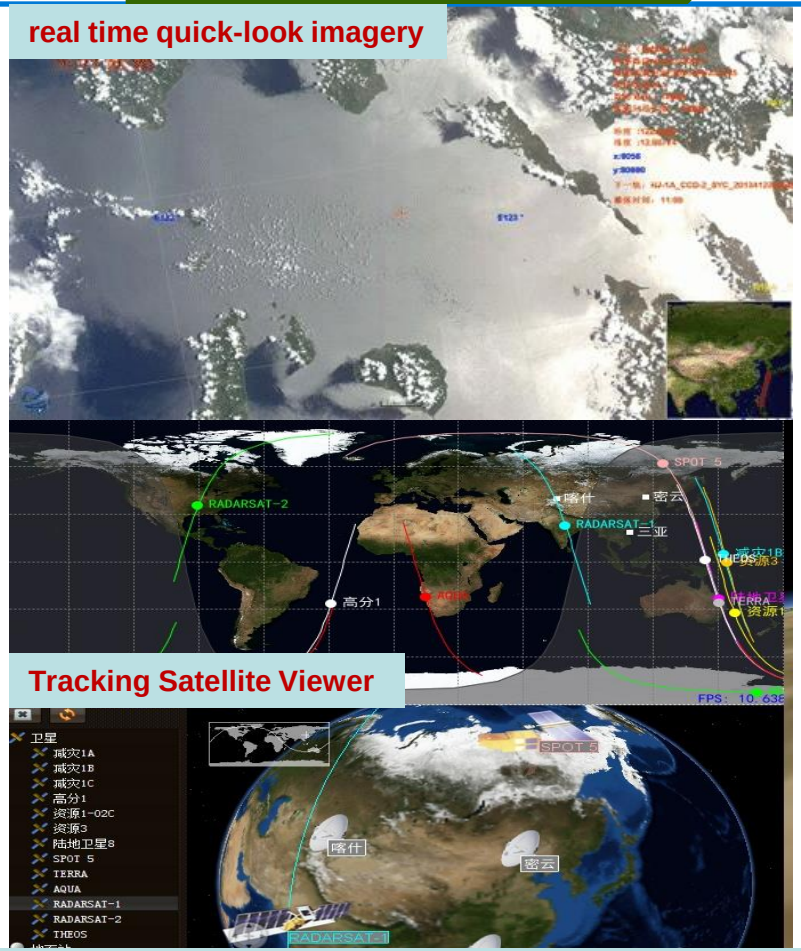
Low-cost “virtual ground station” for disaster mitigation

- 2Mbits **internet connection**
- **two computers** and a large **monitor or TV screen**
- Distributing **real time quick-look imagery** of high resolution satellite

RADI’s three stations receive data from satellites **covering 70% of Asia.**

SatSee System

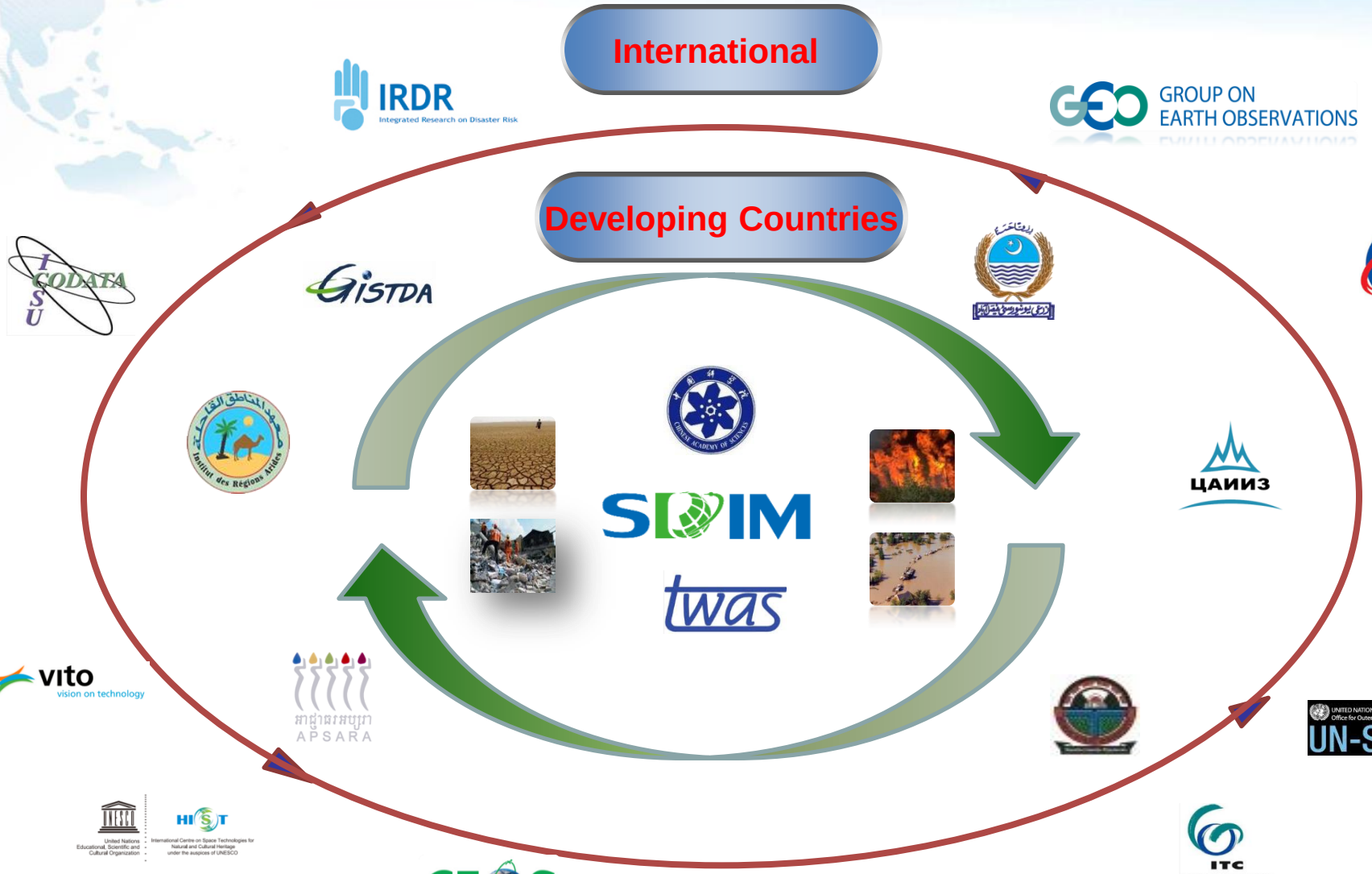
real time quick-look imagery



Tracking Satellite Viewer

Installed in **Kirghizstan, Mongolia, Belgium, and Cambodia**

International Network



International Network

International

- Integrated Research on Disaster Risk(IRDR)
- UN-SPIDER
- UNISDR
- International Society for Digital Earth(ISDE)
- Group on Earth Observations(GEO)
- Committee on Data for Science and Technology(CODATA)
- the Flemish Institute for Technological Research (VITO)

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Developing Countries

- GISTDA- Thailand
- NEMA- Mongolia
- DPNET- Nepal
- IRA- Tunisia
- DMCSL- Sri Lanka
- LAPAN- Indonesia
- MMUST- Kenya
- DoA- Papua New Guinea

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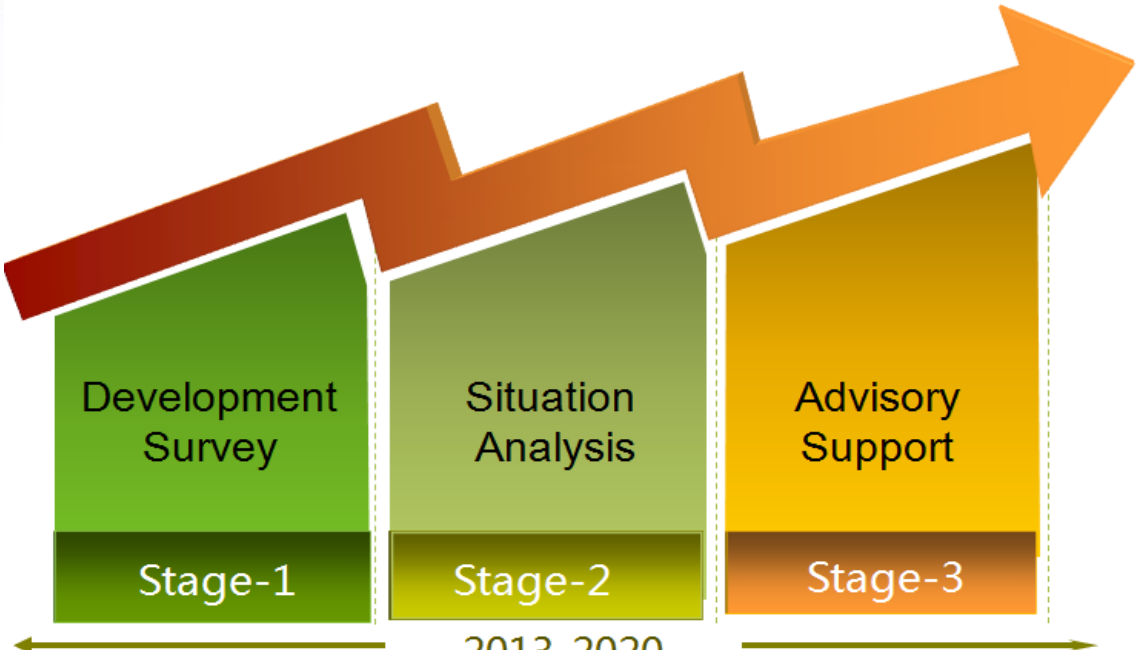
Scientific Report & Advisory Services

Reasons for the development gap of space technology for disaster mitigation in developing countries remain unclear



Drought

Earthquake

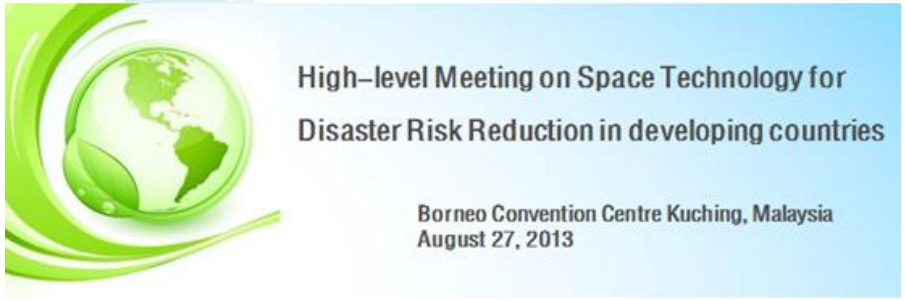
Typhoon

- Current Progress in Developing Countries
- Shortages and Requirements
- Future Development Support

Scientific Report & Advisory Services

Linking Science and Policy for Disaster Risk Reduction

A Joint Working Group was Launched at the1st DDR Meeting



Guo Huadong
Director General
SDIM

Barbara Ryan
Secretariat Director
GEO

John Richards
President
ISDE

Mazlan Hashim
Director,
UTM-IGST
Malaysia

Peou Hang
Deputy Director General
APSARA
Cambodia

Luciano Parodi
Minister-Counselor
MFA
Chile

GEO GROUP ON EARTH OBSERVATIONS
IRDR
ISDE
ITC UNIVERSITY OF TWENTE.
CEOS
SDIM
UN-SPIDER

Working with UNISDR

Proposed Collaboration between CAS-TWAS SDIM and UNISDR on Space Technology for Disaster Risk Reduction in Developing Countries

Areas of Collaboration

- exchanging experiences in the areas of space technology applications for DRR in developing countries.
- providing scientific and strategy advice for the formulation of progress plans for space technology for DRR in developing countries.
- -A Joint Working Group (JWG) between SDIM and UNISDR is proposed to be established strengthening international cooperation on DRR. The JWG, in collaboration with other units, will prepare progress reports, highlighting emerging examples of good practice as well as problem areas.
- Strengthening joint activities and regional partnership to provide assistance to developing countries in the field of DDR, with emphasis on capacity building and educational programmes.

Background
Every year countrie
While developed
respond to and
environments and
long-lasting. Many
governments of de
involves not only na

Invaluable expertis
technologies tied to

Ms. Margareta Wahlström, **UN Special Representative of the Secretary-General for Disaster Risk Reduction**, visited SDIM

UNISDR
The United Nations Office for Disaster Risk Reduction

Scientific Report & Advisory Services

World Conference on Disaster Risk Reduction 2015

World Conference on Disaster Risk Reduction
2015 Sendai Japan

UN World Conference on Disaster Risk Reduction
2015 Sendai Japan

Earth observations in support of national strategies for disaster-risk management

A Synergy Framework for the integration of Earth Observation technologies into Disaster Risk Reduction

Final Issue, dated 25 February 2015

UNOOSA

UNITED NATIONS Office for Outer Space Affairs
UN-SPIDER

esa

DLR

SPIM twas

GROUP ON EARTH OBSERVATIONS

unitar
UNOSAT

FAO FIAT PANIS

JAXA

NDRCC 民政部国家减灾中心 NATIONAL DISASTER REDUCTION CENTER OF CHINA

Education & Training

Provide **long-term and short-term** access to research and education opportunities for early- and mid-career experts for improving scientific capacity in space technologies for disaster mitigation in developing countries

International Students and Scholars(2015)

15 students at SDIM:

5 from Pakistan, 4 from Thailand, 1 from Egypt, 1 from Mongolia,

1 from Nepal, 1 from Iran, 1 from Ghana, and 1 from India

- **President's Fellowship Programme for PhD Candidates from Developing Countries**
- **SDIM Postdoctoral Fellowship**
- **SDIM Visiting Scholars Fellowship**

Training Workshop on Space Technology for Disaster Mitigation

Sanya, China 11-22 November, 2013

Overall Objective: to make the participants aware of the potential of space technology for various phases of disaster risk management, and to enhance the capacity building for developing countries to tackle disaster issues using advanced space technologies.

Participants: early- and mid-career scientists from developing countries in Africa, Asia and Latin America.

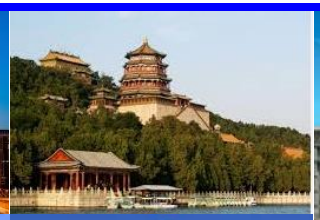
Financial Assistance: round-trip international airfares, lodging, field tour, local transportation, etc.

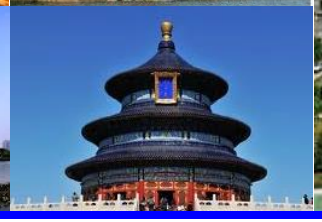
More information: SDIM@radi.ac.cn

2nd Training Workshop

2nd International Training Workshop on Space Technology for Disaster Mitigation

***Beijing, China*, 3rd -13th June, 2014**




3rd Training Workshop

From July 20 to August 5, 2014, **19** representatives from 7 Shanghai Cooperation Organization(SCO) member countries and observer countries (Kyrghyzstan, Tajikistan, Uzbekistan, Pakistan, Mongolia, Iran and China, etc.) attended the 3-week training courses. The workshop was held at RADI's Kashi Campus in Xinjiang Province.








Group Activity

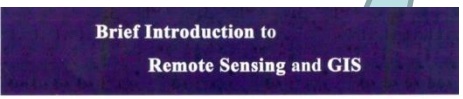
Visit

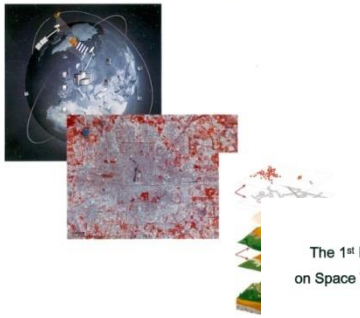
Friendship

- Research and Practical Skills
- Deepen the Understanding of Disaster Issues in Developing Countries
- Enhance Friendship

Presentation

Group Discussion





Handbook

Completion report

Lecture

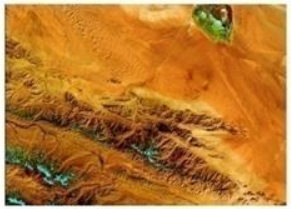
Practice

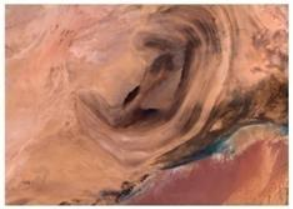



SDIM twas

CAS-TWAS Centre of Excellence on Space Technology for Disaster Mitigation


Thanks!



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