



**unitar**

United Nations Institute for Training and Research

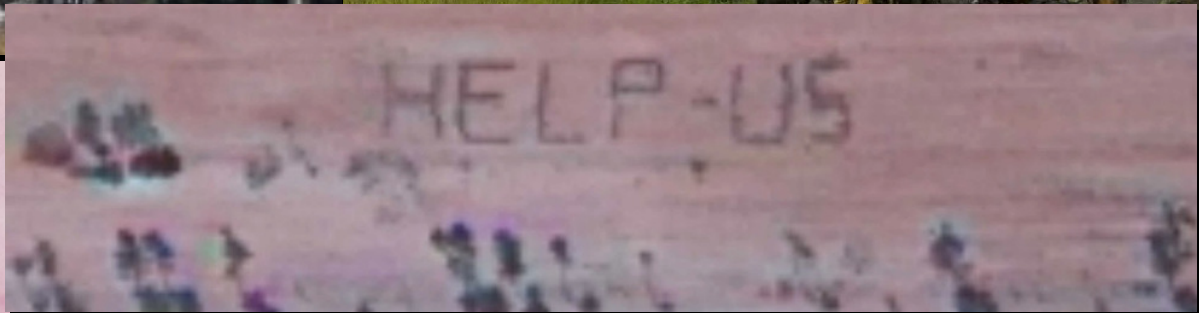
# Mainstreaming space technologies for effective disaster management



Einar Bjorgo, Ph.D

**UNOSAT**

**12 March 2013**



## About UNOSAT

- UNOSAT is the Operational Satellite Applications Programme of UNITAR – entirely dedicated to researching and applying solutions in geospatial information, satellite data/imagery analysis, and integrated systems (GIS, navigation, geopositioning)
- Launched in 2000 as a project, it has evolved into a mature UN service with global outreach supported by a network of partners worldwide
- UNOSAT means over 1000 maps/analyses since 2000, taskings in over 250 emergencies & conflicts; professional training; research & methodology



knowledge, international, participatory approach, r  
diversity, innovation, knowledge sharing, research  
ship, transfer, expertise, new technology  
learning by doing, network  
ship, skills building  
ing, ext

# UNOSAT - AREAS OF OUTPUT

3

## Humanitarian Aid and Relief Coordination

Crisis & Situational Mapping

Damage assessment



## Human Security

Monitoring

Human Rights

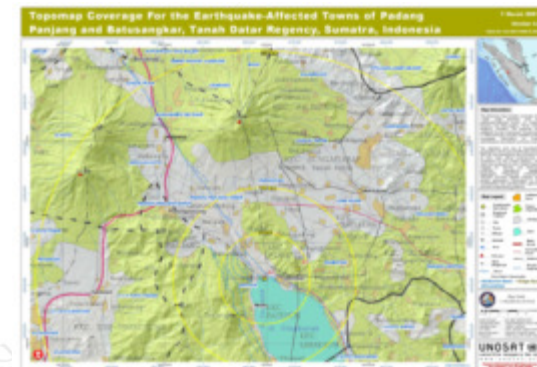
Safety and Security



## Territorial Planning and Monitoring

Capacity Development & Technical Assistance

In-country project development



knowledge, innovation, diversity, inclusion, transfer, learning by doing, research, technology, network, leadership, skills building, etc.

## Humanitarian Aid and Relief Coordination

- . Crisis & Situational Mapping
- . Damage assessment

## Human Security

- Monitoring
- Human Rights
- Safety and Security

## Territorial Planning and Monitoring

- Capacity Development & Technical Assistance
- Project development & Implementation

**OCHA**  
**UNICEF**  
**UNHCR + SHELTER**  
**UNDP + E. RECOVERY**  
**WORLD BANK**

**DPKO + MISSIONS**  
**OHCHR + PANELS**  
**UNHCR**  
**UNDSS**  
**UNDFS**  
**UNDPA**

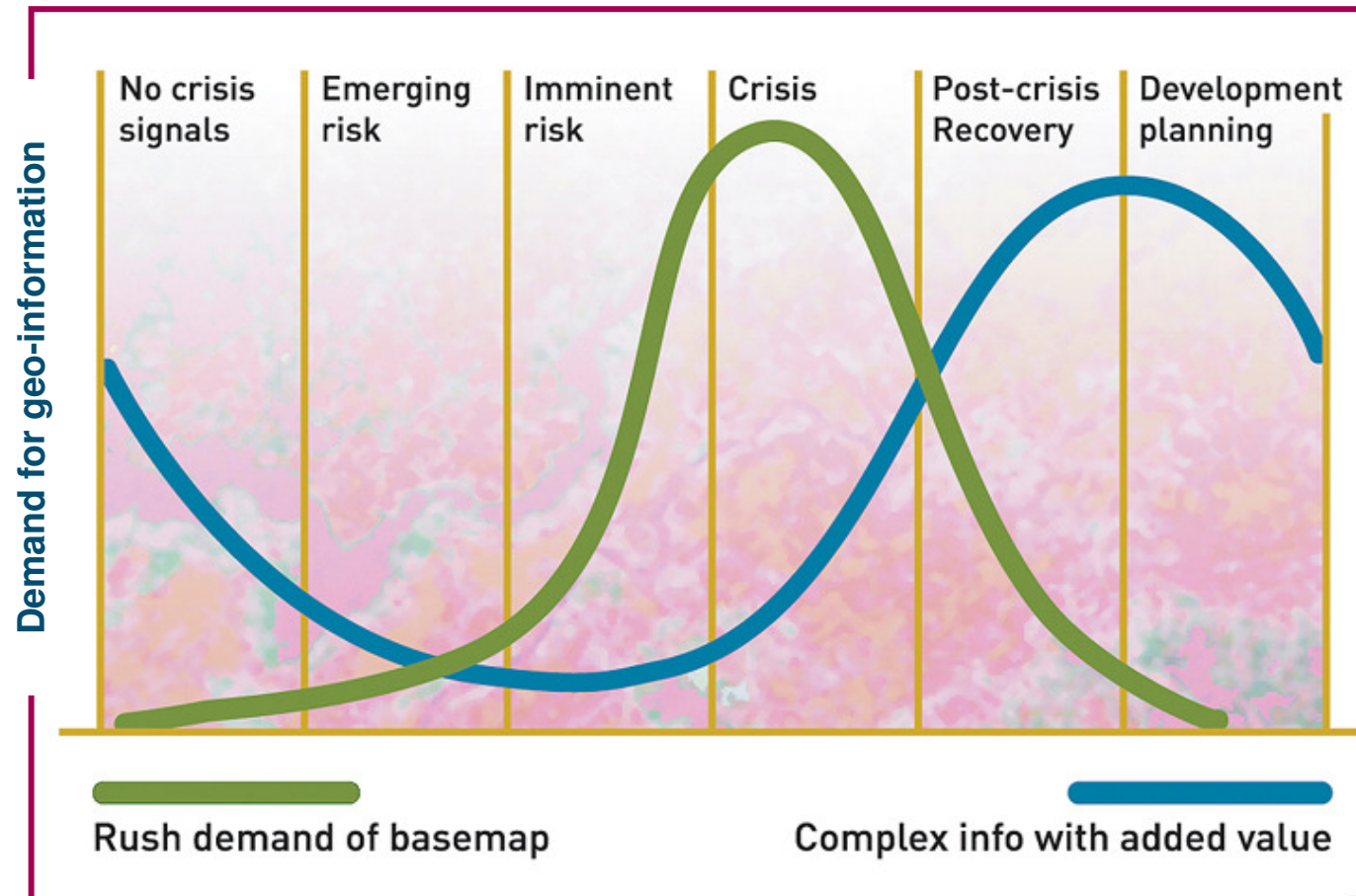
**UNDP/BCPR**  
**UN-HABITAT**  
**IOM**  
**NTL GVTS**

# Disaster management cycle



knowledge, international, participatory approach, research, diversity, innovation, knowledge sharing, research, bin. transfer, expertise, new technology, learning by doing, network, ship, skills building, ing, ext

## UNOSAT integrated response model for humanitarian relief and development



knowledge, international, participatory approach, r  
diversity, innovation, knowledge sharing, research  
ship, transfer, expertise, new technologi  
learning by doing, network  
ship, skills building  
ing, ext

## **ADPC**

- . Capacity development
- . Regional
- . National

## **ESCAP**

Capacity development

Mapping

Data sharing

## **IGAD**

Capacity Development & Technical Assistance

Data development and sharing

knowledge, international, participatory approach, r  
diversity, innovation, knowledge sharing, research  
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ing, ext

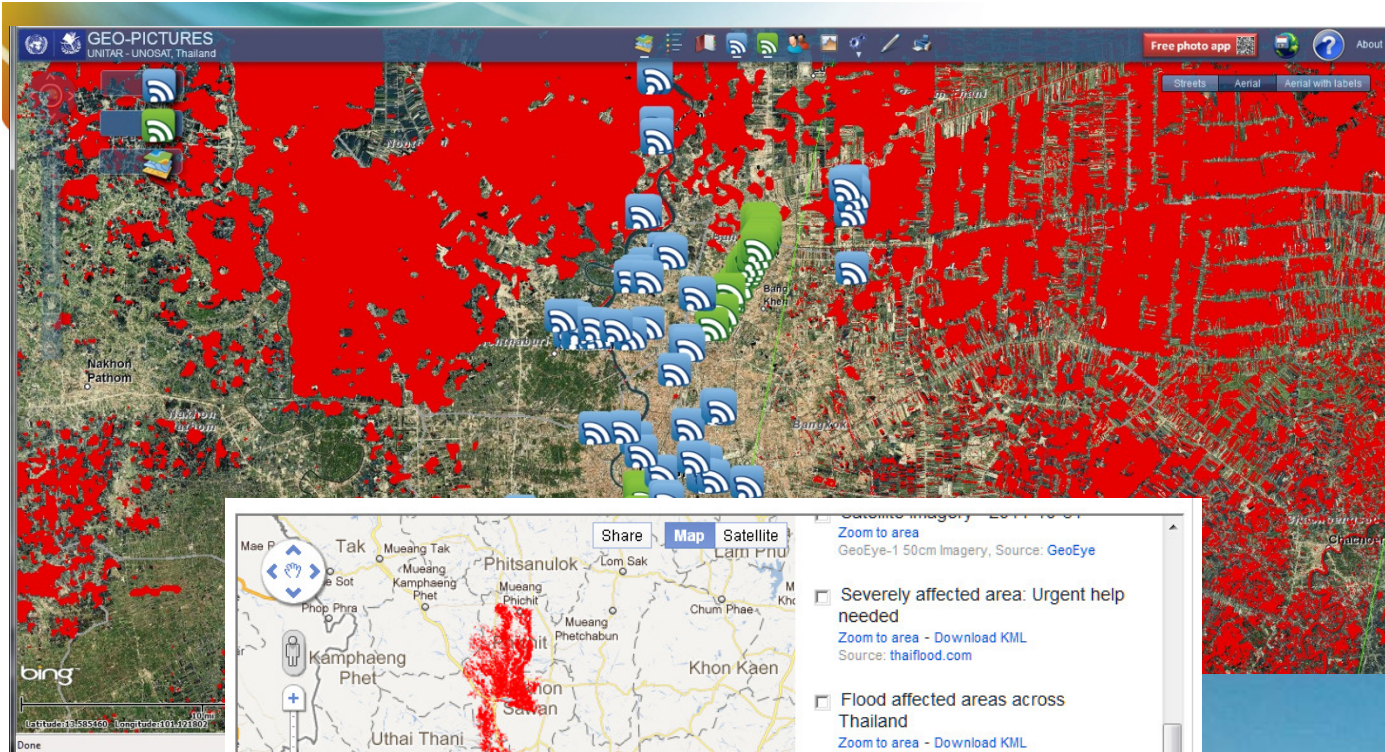


India and WHO polio eradication campaign planning as collaborative approach, Bihar, India.

Satellite imagery provided by UNOSAT through NSPO.

**No polio cases since vaccine campaign in Bihar!**





Map interface showing flood extent vectors and various overlays:

- Severely affected area: Urgent help needed  
Zoom to area - Download KML  
Source: [thaiflood.com](http://thaiflood.com)
- Flood affected areas across Thailand  
Zoom to area - Download KML  
Source: [thaiflood.com](http://thaiflood.com)
- Flood Extents - Thailand  
Zoom to area - Download KML  
Source: [UNITAR-UNOSAT](http://UNITAR-UNOSAT). Metadata [here](#).
- Satellite imagery - 2011-11-01  
Zoom to area  
NASA MODIS 250m Resolution Imagery Bands 3-6-7, Source: [NASA](http://NASA)
- Bangkok risk areas and water barriers  
Zoom to area - Download KML

Google Crisis Response  
a google.org project



## Thailand floods 2011

Sharing of flood extent vectors  
Crowd-sourced geo-photo display

**GEO-PICTURES**  
UNITAR - UNOSAT, Thailand

Free photo app

OpenStreetMap Streets Aerial Aerial with labels

ASIGN Crowd

- Record Date: 2011-11-07T14:49:47
- My Village
- Record Date: 2011-11-07T12:00:50
- My home town flood effect**  
Record Date: 2011-11-07T12:01:27
- New Public Truck
- Record Date: 2011-11-07T12:00:40
- Uploaded with ASIGN from AnsuR  
Record Date: 2011-11-07T11:38:02
- Uploaded with ASIGN from AnsuR  
Record Date: 2011-11-07T11:37:27
- Uploaded with ASIGN from AnsuR  
Record Date: 2011-11-07T11:37:05

Nakhon Phanom

Chachoengsao

TOC

Layer Visibility

- ASIGN photo
- Flood Analyses
- Places
- Post-event image

bing

20 km

10 m

Latitude: 19.653069 Longitude: 101.156304

POWERED BY esri

My home town flood effect

Record Date: 2011-11-07T12:01:27

Chachoengsao

knowledge, international, participatory and  
diversity, innovation, knowledge sharing, research  
sin. transfer, expertise, new technology  
learning by doing, network  
ship, skills building, ext

***UNOSAT's suite of UAVs:  
SenseFly plane  
Microdrones quadrocopter***



## UNOSAT UAV capacity: Successful deployment to Haiti



knowledge, international, participatory approach, m  
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learning by doing, network  
ship, skills building  
ing, ext

# UAV SURVEY OF GRANDE RAVINE, PORT AU PRINCE, HAITI



**Aerial Survey Conducted with UAV  
(Swinglet CAM) on 8 February 2012**



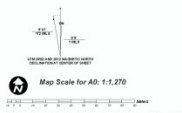
**Aerial Survey** 

Production Date: 12/03/2012  
Version: 1.0  
UNOSAT Activation Number: DT20120114HTI  
Analysis Exhibit:  
Center: 12°21'11.8888"N 74°13'20.8888"W  
Lower Left: 12°21'11.8888"N 74°13'17.0000"W  
Lower Right: 12°21'11.8888"N 74°13'14.0000"W

This aerial survey of the Grande Ravine section of Port au Prince, Haiti was conducted as part of the first operational deployment of an Unmanned Aerial Vehicle (UAV) by the United Nations in February 2012. A total of five sites across Port au Prince were surveyed by a UNITAR/UNOSAT field deployment in direct support to on-going earthquake recovery projects of the International Organization for Migration (IOM).

In the case example of Grande Ravine illustrated in this map, the UAV acquired an image mosaic of the settlements along the steep hillsides at an unprecedented spatial resolution of only 7 centimetres; thus providing IOM and local government authorities with the most detailed aerial imagery ever acquired over the city.

Technical support for the UAV system was provided by SenseFly, and the mission was conducted in the context of the GMS GEO-PICTURES project. The results of this UAV survey have been validated on the ground. Please send feedback to UNITAR/UNOSAT at the contact information below.



Project Manager: Alexander von Stechow  
Project Director: Philippe Buisson  
Project Lead: Alexander von Stechow  
Project Lead: Alexander von Stechow

The production and use of geospatial information and related data should be done with care and responsibility. The user should be aware of the limitations of the data and the accuracy of the information. The user should also be aware of the potential for misuse of the information and should take appropriate measures to protect the information.

Contact Information:  
unosat@unitar.org 267 Hotline:  
+41 76 683 4888  
www.unitar.org/unosat





- Joint capacity development w. ADPC

- As part of ADPC trainings in Bangkok
- Train the trainers
- In-country hands-on



UNIVERSITY OF COPENHAGEN | [Søkbene](#) | [Donat](#) | [Phone Book](#) | [Kontakt \(in Danish\)](#) | [Shortcuts](#) |

## Master of Disaster Management


**Watch the new video:**  
Diary of Disaster - A Master of Disaster Management Student in Haiti

3:25 [blip.tv](#)

**The Master of Disaster Management programme** will provide you with the appropriate skills for disaster management at a national and international level in areas of natural and man made disaster, climate change, and terrorism.

- [Read more about the programme](#)

**In association with IFRC**



**NEW SHELTER ONLINE COURSE**

In the Autumn semester 2011 Master of Disaster Management will offer the course Shelter and Settlements in Disasters in association with the International Federation of Red Cross and Red Crescent Societies.

The two month long course will start 10 October 2011, and is planned to include two weeks of training in Copenhagen as well as six weeks of distance learning.

- [More information and application form](#)


**Combining studies with your job**

**FLEXIBILITY**

The degree can be taken either as a one year full-time programme, or part time over 2-3 years, allowing you to study and work at the same time.

- [See how it works](#)

**Collaboration with UNITAR**




**GEO INFORMATION COURSE**

Master of Disaster Management is offering an intensive course in Geo Information in Disaster Situations in close collaboration with UNITAR - United Nations Institute for Training and Research.

The course is organised by UNOSAT (UNITAR's Operational Satellite Applications Programme) and is only open to a limited number of applicants.

- [More information on the course](#)

**Ask a student**



**STUDENT AMBASSADORS**

If you want to know what former or current students think about the programme, then you can contact your local MDMA Ambassador directly.


- [Find your Ambassador](#)

**FACEBOOK**

You can also join the Master of Disaster Management Facebook page to get in touch with both current and former students. This way you can also keep updated with news and events related to the programme.

- [MDMA on Facebook](#)

**Graduation 2011**



Congratulations to the new graduates of the Master of Disaster Management class of 2011.

**MDMA Newsletter**

Subscribe to the newsletter from Master of Disaster Management.

Insert e-mail:

[Subscribe](#) [Unsubscribe](#)

Join our new Facebook page

**Master of Disaster Management**

[facebook](#) 288

**How to apply**

**APPLICATION DEADLINES**

- **Master's programme:** We have continuous enrolment. The final deadline for the academic year 2012-2013 is 1 April 2012.
- **Intensive courses:** Application deadlines can be found in the top of each course description.

**APPLICATION FORM**

- [Start your online application here!](#)

**Intensive Courses**

If you do not have enough time to study the entire degree programme, then maybe our selection of intensive courses has something for you.

- [More information on intensive courses](#)

**UPCOMING COURSES**

**Shelter and Settlements in Disasters**  
10 October - 2 December 2011  
This course is partly e-learning

**Research Design**  
9 January - 20 January 2012

**Risk Assessment Methods**  
30 January - 22 February 2012

**Risk Reduction and Preparedness**  
28 February - 07 March 2012

**Geo Information in Disaster Situations**  
5 March - 23 March 2012

**Disaster Preparedness Management**  
13 April - 9 May 2012

**Health in Emergencies and Refugee Health**  
11 April - 9 May 2012

**Water Supply & Sanitation in Emergencies**  
14 May - 13 June 2012

**Sustainable Recovery**  
14 May - 13 June 2012

**We recommend**

**INTERNSHIPS WITH OCHA IN GENEVA**

International Search and Rescue Advisory Group (INSARAG)

UN Disaster Assessment & Coordination (UNDAC)

## GIS4DRM-7

The 7<sup>th</sup> International Training Course on  
**GIS for Disaster Risk Management**  
17-28 October 2011, Bangkok, Thailand



**The Asian Disaster Preparedness Center (ADPC)**  
Established in 1986, ADPC is a leading regional resource center dedicated to disaster risk reduction. ADPC works with governments, NGOs and communities of the Asia and Pacific regions to strengthen their capacities in disaster preparedness, mitigation and response through professional training, technical assistance, regional program management, country project demonstration, information sharing and research. ([www.adpc.net](http://www.adpc.net))

**The Asian Institute of Technology (AIT)**  
The Geoinformatics Center of the Asian Institute of Technology (AIT) in Thailand is a non-profit center for training and capacity building in Remote Sensing, GIS and GPS technologies established at AIT in 1995. The Center has under-taken a number of disaster and environment related projects in South and Southeast Asia, drawing participants from more than 25 countries within the Asia-Pacific region and to date more than 1,000 persons have been trained. ([www.geoinf.ait.ac.th](http://www.geoinf.ait.ac.th))



**The International Institute for Geo-Information Science and Earth Observation, University of Twente (ITC)**  
Founded in 1950 as a part of the University of Twente in the Netherlands, ITC provides international postgraduate education, research and project services in the field of geo-information science and earth observation using remote sensing and GIS. Since 2005, ITC is an associated institution of the United Nations University (UNU). The main focus of UNU-ITC is to support networks of Universities and training institutes from developing countries that are involved in training and research in the use of geo-information science and earth observation for disaster risk management. ([www.itc.nl](http://www.itc.nl))



**UNITAR'S OPERATIONAL SATELLITE APPLICATIONS PROGRAMME (UNITAR-UNOSAT)**  
UNOSAT is a technology-intensive program delivering imagery analysis and satellite solutions to relief and development organizations within and outside the UN system to help make a difference in critical areas such as humanitarian relief, human security, strategic territorial and development planning. UNOSAT develops applied research solutions keeping in sight the needs of the beneficiaries at the end of the process. UNOSAT's goal is to make satellite solutions and geographic information easily accessible to the UN family and to experts worldwide who work at reducing the impact of crises and disasters and help nations plan for sustainable development. ([www.unitar.org/unosat](http://www.unitar.org/unosat))

For more information, please visit [www.adpc.net/?GIS4DRM-7](http://www.adpc.net/?GIS4DRM-7)

**CONTACT INFORMATION FOR INQUIRIES AND APPLICATION:**

**Training Services Unit (TSU)**  
**Asian Disaster Preparedness Center**  
979/66-70, 24th Floor SM Tower, Paholyothin Road, Samsen Nai, Phayathai, Bangkok, 10400 Thailand  
Tel: +66 (02) 298 0681-92 Fax: +66 (02) 298 0012 Email: [tsu@adpc.net](mailto:tsu@adpc.net) URL: [www.adpc.net](http://www.adpc.net)

Become ADPC TSU's friends on [facebook](https://www.facebook.com/ADPC) <http://www.facebook.com/ADPC>



# UNOSAT-facilitated GDACS Satellite Mapping Coordination System. Operational and agreed tool by OCHA, EC, users, analysis centres

The screenshot shows a web browser window displaying the GDACS Satellite Mapping Coordination System. The browser's address bar shows the URL: `unosat-dev.web.cern.ch/unosat-dev/smcsv2/main.php#FL-2011-000135-THA`. The page header includes the GDACS logo and the text "Global Disaster Alert and Coordination System". Below the header, there is a navigation menu with options like "SMCS Site Menu", "Download KML", "RSS of event imagery", and "Upload New". The main content area features a satellite map of Southeast Asia, with a specific satellite image overlayed on a region in Thailand. A metadata panel for this image is visible, containing the following information:

- Date: 2011-11-02
- IMGName: ENVISAT-ASA\_WSM\_1CNPDE201111013\_03
- Sensor: ENVISAT\_ASAR
- Pre/Post: Status: Yes
- Resolution(m): 90
- Uploaded By: UNOSAT
- Comments:

Below the metadata panel, there are filter options for "Filter Post/ Pre" and "Filter Imagery 2", with a "Post Only" radio button selected. A table at the bottom of the page lists image details:

IMAGE DATE	Resolution(m)	IMAGE NAME
2011-09-28	100	ENVISAT-1-050097-001 70500-00358661-WS_ASA_WS__OP.jpg

The browser's status bar at the bottom indicates "Speakers / HP: 29%".



[www.unitar.org/unosat](http://www.unitar.org/unosat)  
[einar.bjorgo@unitar.org](mailto:einar.bjorgo@unitar.org)



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Institut des Nations Unies pour la Formation et la Recherche  
Instituto de las Naciones Unidas para Formación Profesional e Investigaciones  
Учебный и научно-исследовательский институт  
Организации Объединенных Наций  
معهد الأمم المتحدة للتدريب والبحث  
联合国训练研究所

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