

Efficient Emergency Response Using Earth Observation

29 /September / 2016

Khaled Mashfiq
Khaled.MASHFIQ@unitar.org

“2016 International Training Workshop on Natural Disaster Reduction”
September 26th – 30th 2016, Taipei



UNITAR's Operational Satellite Applications Programme - UNOSAT

www.unitar.org/unosat

What is UNITAR?

The United Nations Institute for Training and Research (UNITAR) is a **principal training arm** of the United Nations, working in every region of the world to empower individuals, governments and organizations **through knowledge and learning** to effectively overcome contemporary global challenges.

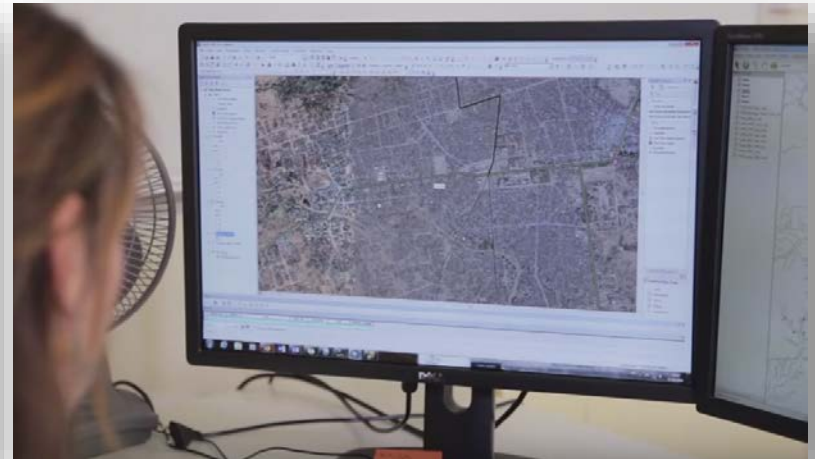
Mission

*“To develop capacities to **enhance global decision-making** and to support translation of those decisions into **action at country level**”*



About UNOSAT

- An [operational programme](#) of UNITAR serving UN, international organizations and governments
- Fully dedicated to [satellite imagery analysis](#), applications of geospatial information technologies, [training and capacity development](#)
- Operational since [2001](#)
- Currently [30 employees](#)
- Presence: [Geneva](#) (hosted at CERN), [Bangkok](#), [Nairobi](#), [N'Djamena](#)



UNOSAT's Main Activities



MAPPING

Analysis, Research and
Innovation



TRAINING AND CAPACITY DEVELOPMENT

Hands on, National and
Regional level, Technical
Backstopping

Knowledge Transfer

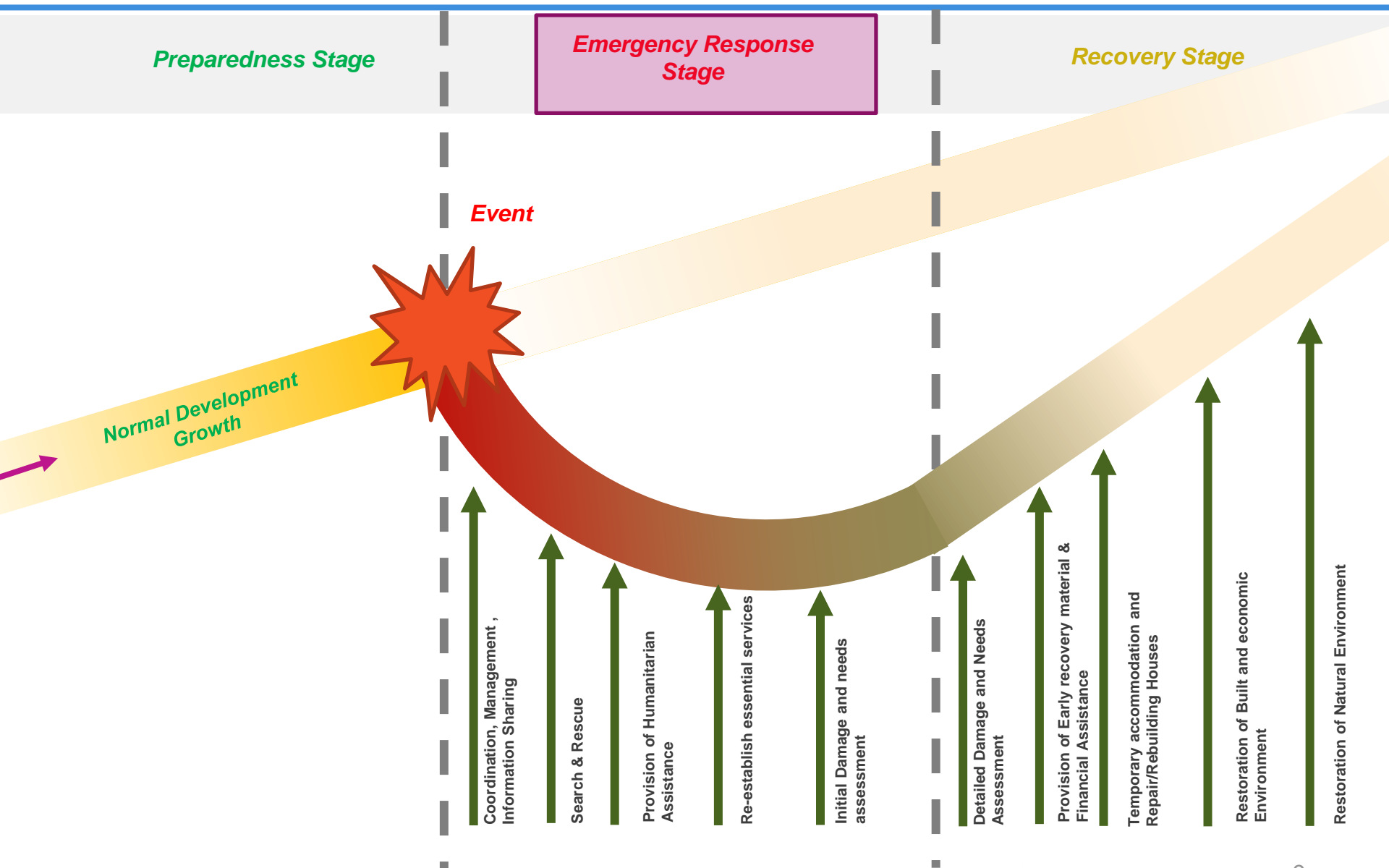
- Major Disaster & Humanitarian Framework
- Role of Geo Spatial Information in Disaster Response
- Workflow: Satellite derived analysis for emergency response
- Geospatial Information for Addressing Varying Needs for Different Phases of Disaster
- Developing Sustainable capacities

Major Disaster & Humanitarian Framework

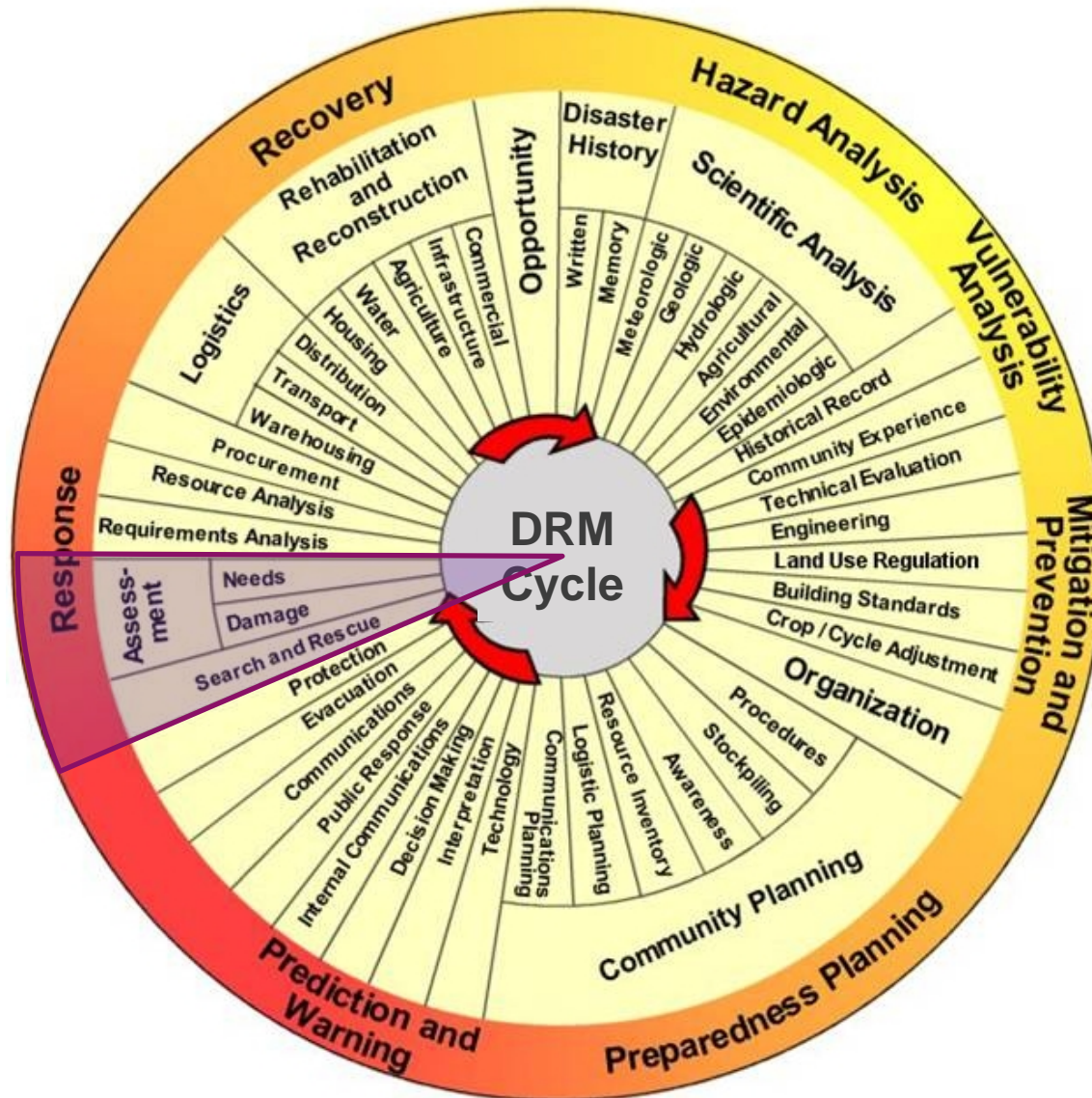
“A complex emergency or **major disaster** is a multifaceted humanitarian crisis in a country, region or society where there is total or **considerable breakdown of authority and response capacity** which requires a multi-sectoral, international response that **goes beyond the mandate or capacity of any single agency and/or ongoing UN country programme**”

Inter-Agency Standing Committee, Dec 1994.

Disaster Impacts and Development

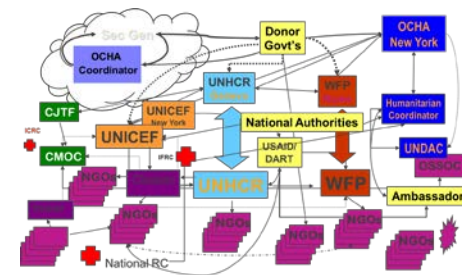


Emergency Response & Disaster management cycle





Disaster Cycle & Uncertainty

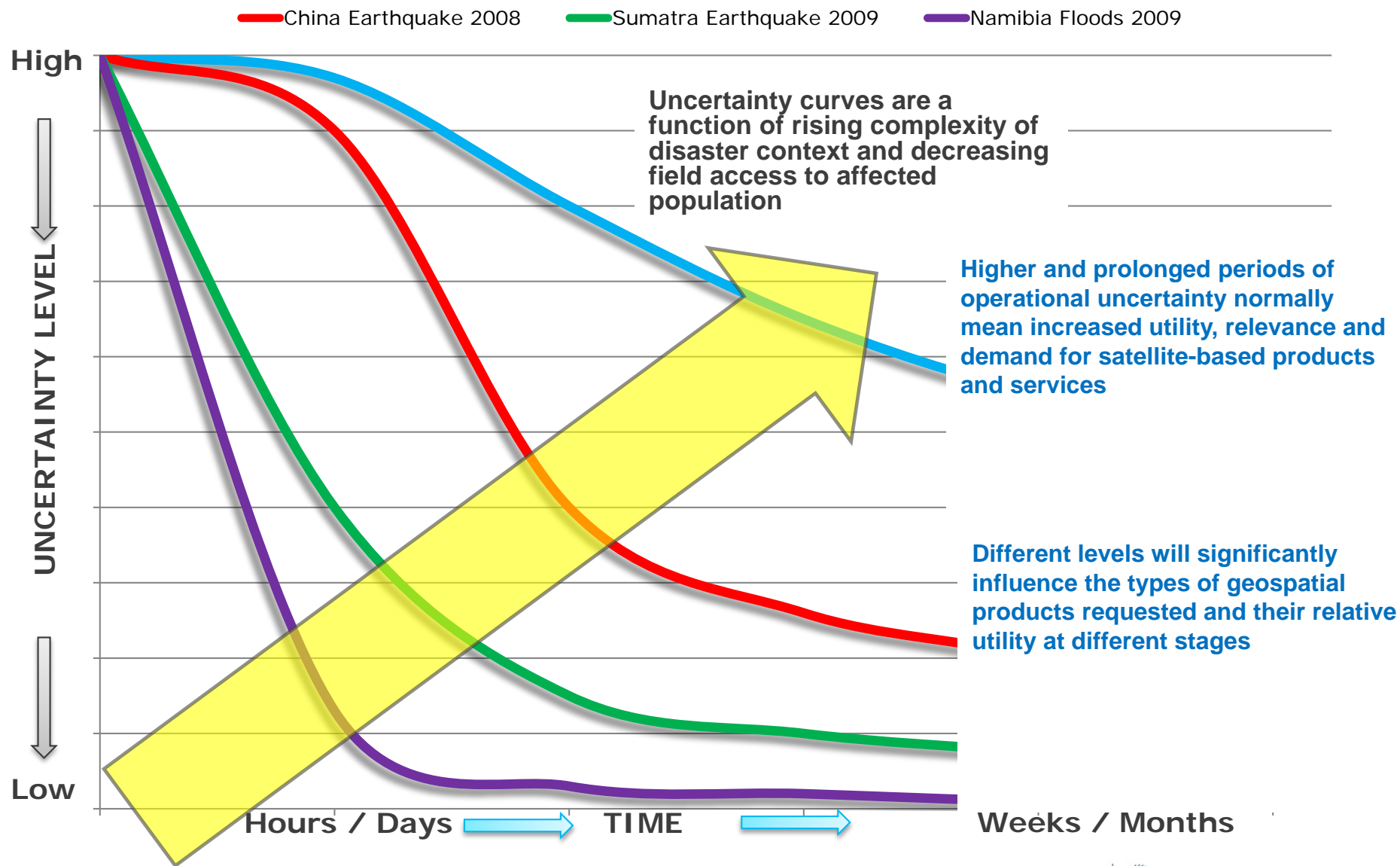


Operational uncertainty highest in early disaster response stage

“Fog of Disaster” - Early stages of major disasters characterized by limited, incomplete and often contradictory information of unknown accuracy related to:

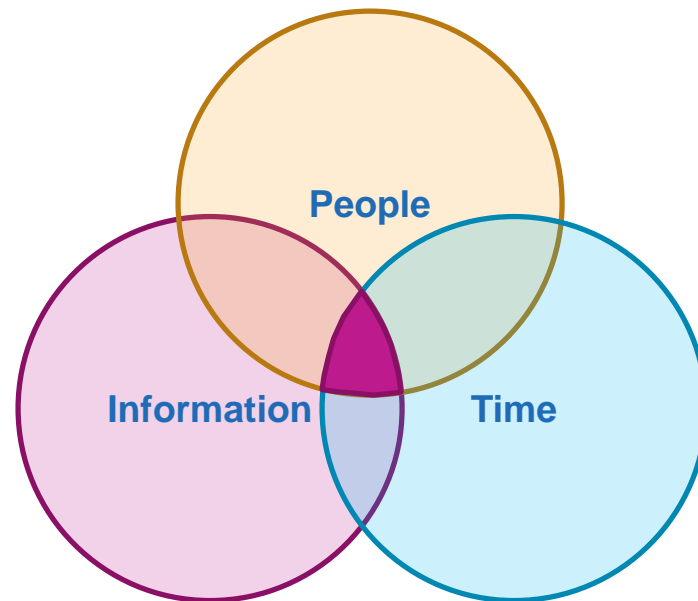
- Geographic extent of affected area(s)
- Numbers & Locations of casualties and at-risk population
- Damages to housing, infrastructure, transport facilities
- Capacity and response of local/national authorities
- Capacity and coordination of Int. humanitarian actors (3Ws Who Does What Where)

UNCERTAINTY LEVELS AS FUNCTION OF TIME & DISASTER CONTEXT (QUALITATIVE)



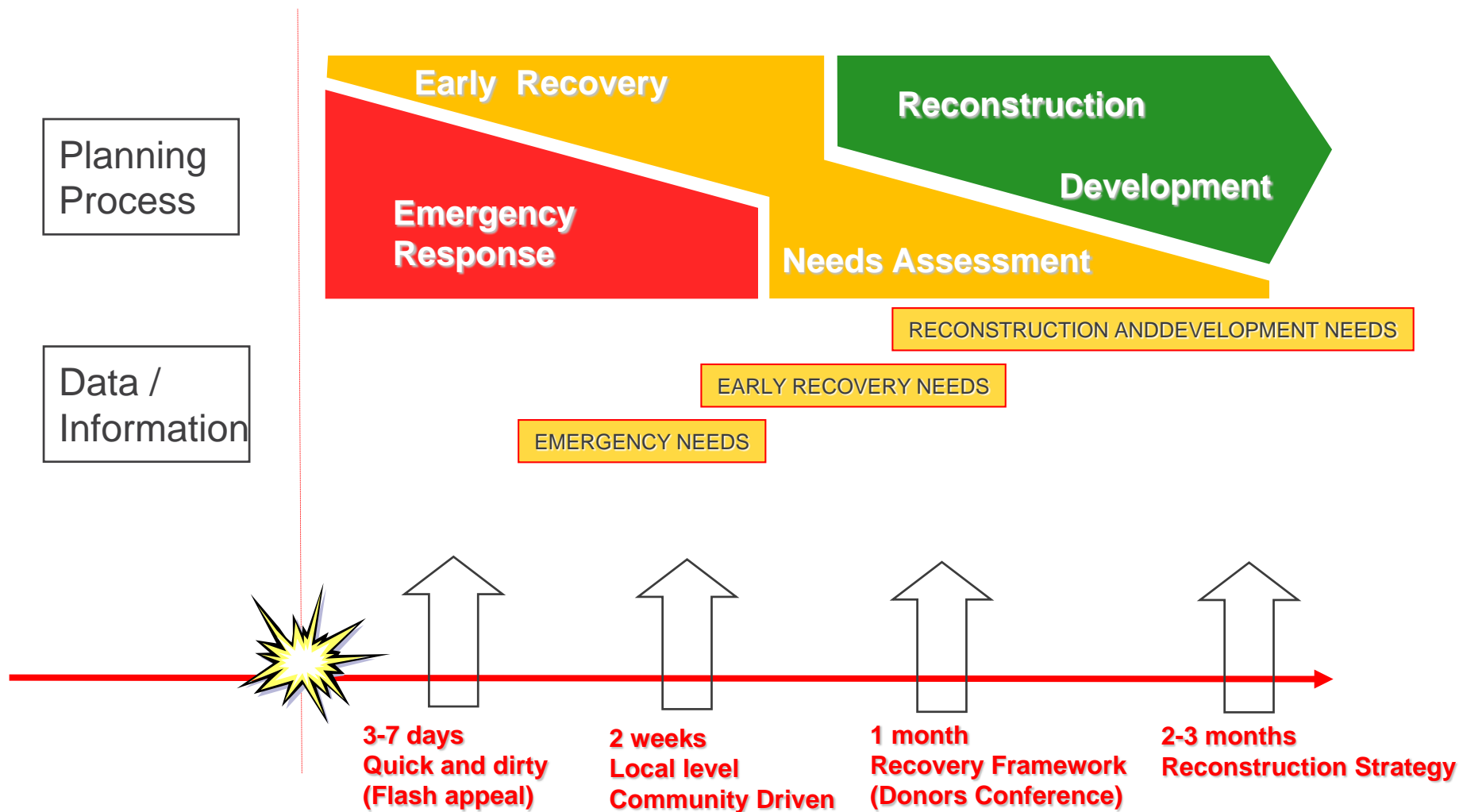
Role of Geo Spatial Information in Disaster Response

Information is the foundation on which decision-making for a coordinated and effective response is based



Objective:

To ensure that **right information** of the humanitarian emergency is provided to the **right person** at the **right time** in a usable form to facilitate situational understanding and decision-making.



If we need to coordinate and manage the response phase of a disaster event what are the questions that you think are relevant for planning and decision making for emergency response?

Where?

Who?

When?

What?

How
Big?

- **Right Information**
- **Right People**
- **Right Time**

A Photo is Worth a Thousand Words!!!!

II. Situation Overview

Government figures on the number of people directly affected by the floods remain unchanged since the previous situation report, at 15.4 million (National and Provincial Disaster Management Authorities, 18 August). Assessments to establish the degree to which affected populations are in need of immediate humanitarian assistance continue. The official death toll has risen to 1,475, with 2,052 people reported as injured. Almost 1 million houses are now reported as having been either damaged or destroyed.

The south of the country continues to feel the impact of the second wave of floods, with a spur of the Indus River now stretching through Jacobabad district in Sindh into Jaffarabad in Balochistan. The Meteorological Department warns of a continuing risk of inundation of low-lying areas of Khairpur, Jacobabad, Ghotki, Sukkur, Larkana, Nawabshah, Hyderabad, Naushahro Feroze and Thatta districts of Sindh in the coming days. The Meteorological Department's Flood Forecasting Division reports that flood levels in the Indus are holding at "extremely high" levels at Guddu and Sukkur in northern Sindh, and rising further downriver at Kotri, as the flood wave continues to move through the province.

Despite the continuing efforts of the Government and the humanitarian community to assist affected populations across the country, large numbers of people are yet to be reached with the assistance they need, particularly in Sindh and Punjab. While funding levels are now improving in key sectors, the continuing threat of flooding in many areas and the manner in which populations are spread across a vast area persist as major operational challenges.

In Khyber Pakhtunkhwa province (KPK), where the response has been quicker to scale up, the Chakdara Bridge in Lower Dir district has been re-opened to light traffic as of 17 August, restoring limited road access to Upper Dir and Chitral districts. The Karakoram highway continues to be blocked, cutting off road access to Gilgit-Baltistan. The Frontier Works Organization (FWO) has indicated that at least three weeks will be required before the road can reopen.

The United Nations Department of Safety and Security (UNDSS) has deployed additional staff to Multan, Sukkur and Mingora in support of the floods response. Further deployments are planned, to cover Abbottabad

UPDATE 2: FLOOD WATER OUTFLOW FROM INDUS NEAR SUKKUR BARRAGE ENTERING BALOCHISTAN PROVINCE, PAKISTAN

Flood Analysis Based on Satellite Data Recorded on 18 August 2010

ANALYSIS SUMMARY: Flood waters have continued to rapidly advance north-west into Balochistan Province as part of the massive outflow from the Indus River caused by a suspected canal breach on 8-9 August 2010, north of Sukkur barrage. Since then, between 8 and 18 August, this outflow body of water has advanced over 120km from the original breach line, covering a total of 2,670 km² and likely inundating approximately 530 villages and 13 towns / cities, along with over 533 km of main roads and 57 km of railway lines and the Shahbaz Airfield. The city of Jacobabad is severely affected, with flood waters completely encircling the city. Route N-65, the railway leading north, is leaving no functional land transport routes for aid or evacuation links to the east and west, leaving the only open route south, however. Towns of route N-65 to Shikarpur are also flooded. Based on a preliminary assessment of the water flow direction over the last two days it appears that the city of Jacobabad is at risk of being completely encircled by flood waters, leaving no functional land transport routes for aid or evacuation.

Disaster coverage by the International Charter 'Space and Major Disasters'. For more information on the Charter, which is about assisting the disaster relief organizations with multi-satellite data and information, visit www.disasterscharter.org



Monsoon Rains & Flooding

18 August 2010

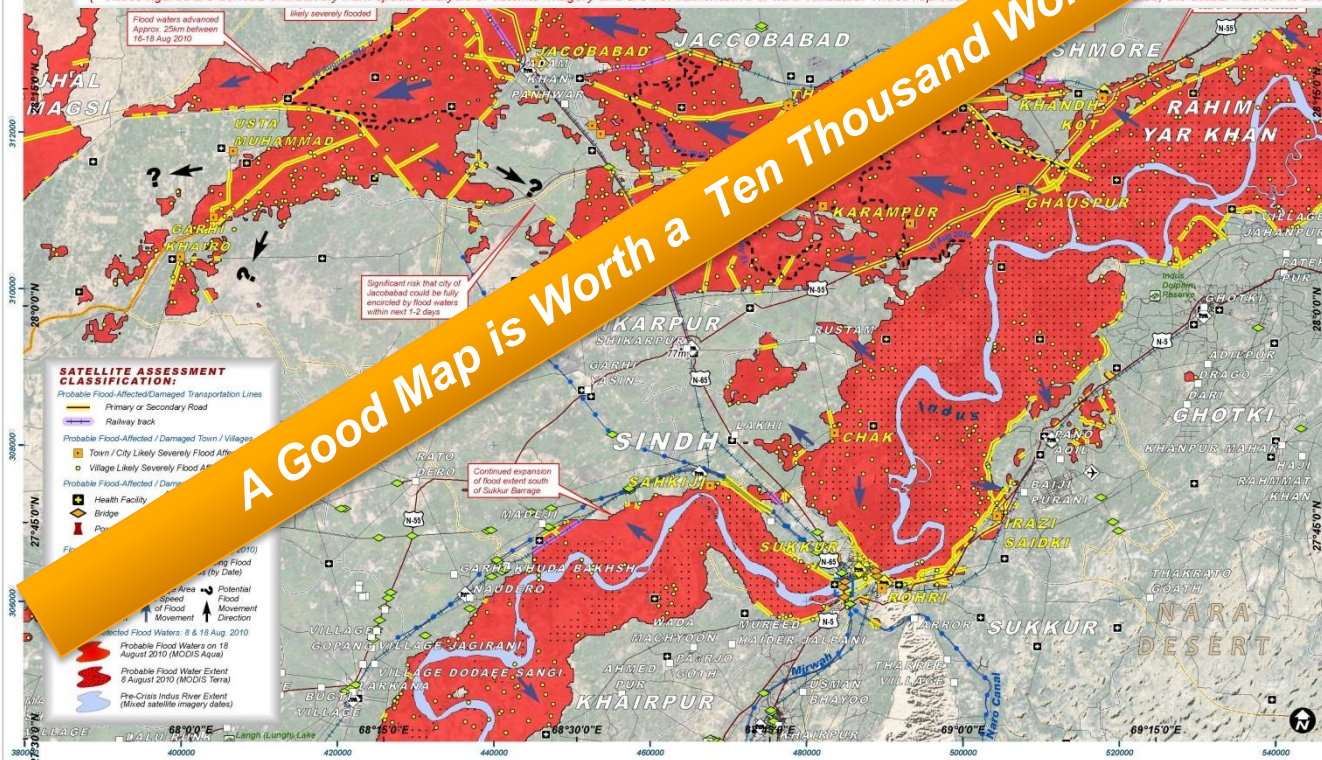
Version 3.0

Glide No: FL-2010-000141-PAK

Analysis Summary of Probable Flood Damaged / Flood-Affected Villages, Towns and Infrastructure by District

Province	SINDH											
District	Dadu	Ghotki	Hyderabad	Jacobabad	Jamshoro	Kashmore	Khairpur	Larkana	Matari	Naushahro Feroze	Qambar Nawab	Shikarpur
Village Count	52	45		292	48	208	68	69	7	58	33	4
Cities	4			6	3	4	1	1		3	1	
Health Facilities (WHC)	3	1		4	1	9	3	2		4	2	
Bridges	3		3	1		3				1		
Roads (km)	40.3	83.2	5.0	187.9	56.0	188.3	15.8	6.2	1.0	2.7	10.5	
Railways (km)	6.1			26.8	35.6	16.0				2.2		

(* These figures are derived exclusively from spatial analysis of satellite imagery and are not authoritative or field-validated. These represent minimum estimates, the actual number of affected villages, towns and infrastructure is likely to be higher.)



A Good Map is Worth a Ten Thousand Words???

- Legend**
- Town / City
 - Health Facility
 - Airport / Airfield
 - Train station
 - Barrage
 - Bridge
 - Protected Site
 - Province Boundary
 - District Boundary
 - Tetral Boundary
 - Primary Road
 - Secondary Road
 - Railroad
 - Irrigation Canal

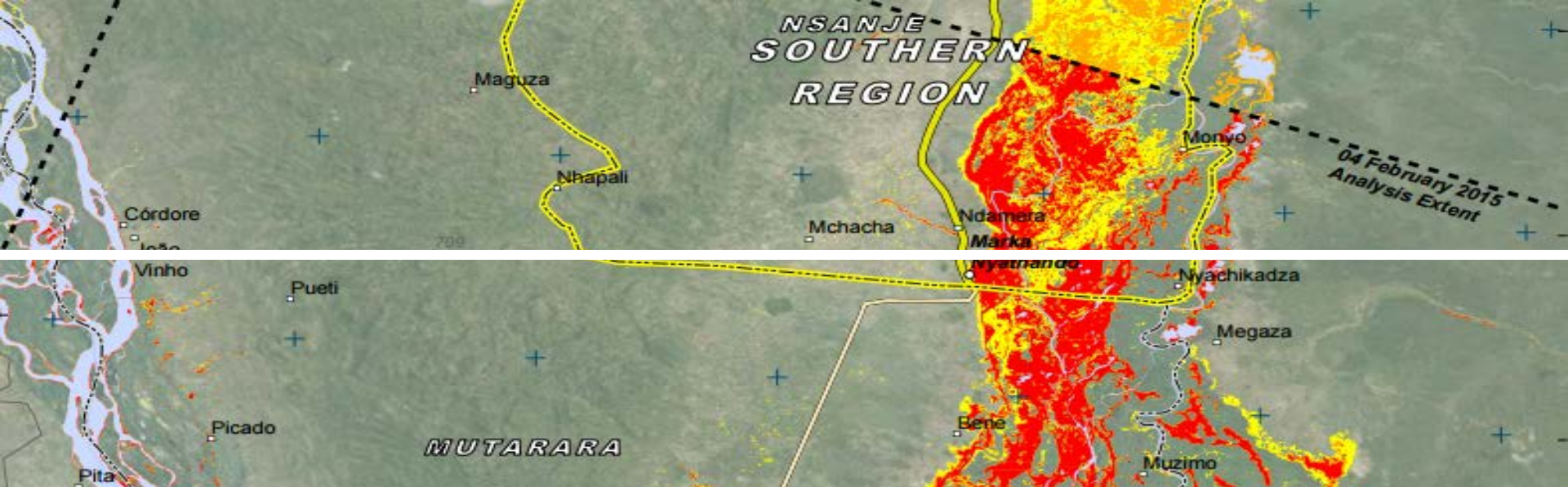
MAP SCALE FOR A3: 1:500,000

0 2.5 5 10 15 20 Kilometers

Crisis Satellite Data (1) MODIS Aqua & Terra
Resolution 250 meters
Image Date 8-18 August 2010
Source NASA Rapid Response
Crisis Satellite Data (2) RADARSAT-2
Resolution 25 meters
Image Date 8 August 2010
Copyright Radarsat 2 © MDA 2010
Source Canadian Space Agency
GIS Data NOAA, OCHA, USGS, OSM
Transport Data Google Map Maker
Transport Data Copyright © 2009 Google - Improve
with Google Map Maker
Refugee Data UNHCR
Hospital Data WHO
Flood Analysis UN/UNSAT
Map Production UN/UNSAT
Projection UTM Zone 42N
Datum WGS-84

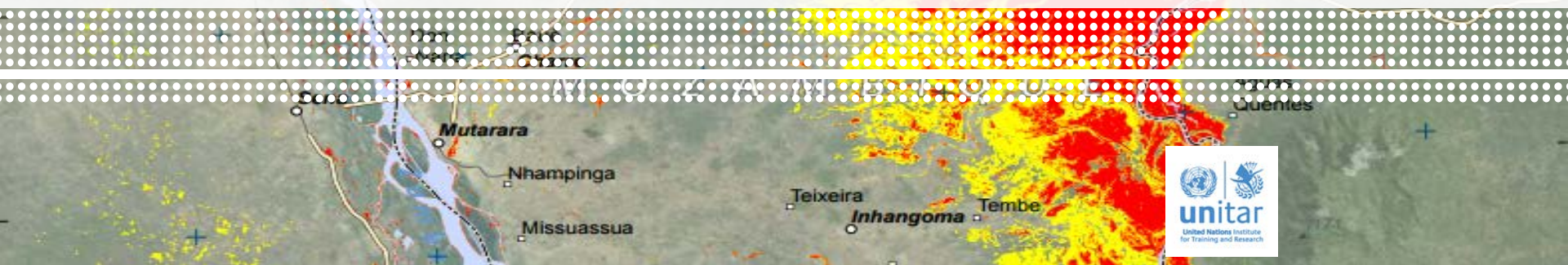
The depiction and use of boundaries, geographic names and related data shown here are not warranted to be error-free nor do they imply official endorsement or acceptance by the United Nations. UNOSAT is a program of the United Nations Institute for Training and Research (UNITAR), providing satellite imagery and related geographic information research and analysis to UN humanitarian & development agencies & their implementing partners.

unitar
United Nations Institute for Training and Research
UNOSAT
Contact information: unosat@unitar.org
24/7 Hotline: +41 76 487 4998
www.unosat.org



Workflow: Satellite derived analysis for emergency response

www.unitar.org/unosat/rapid-mapping

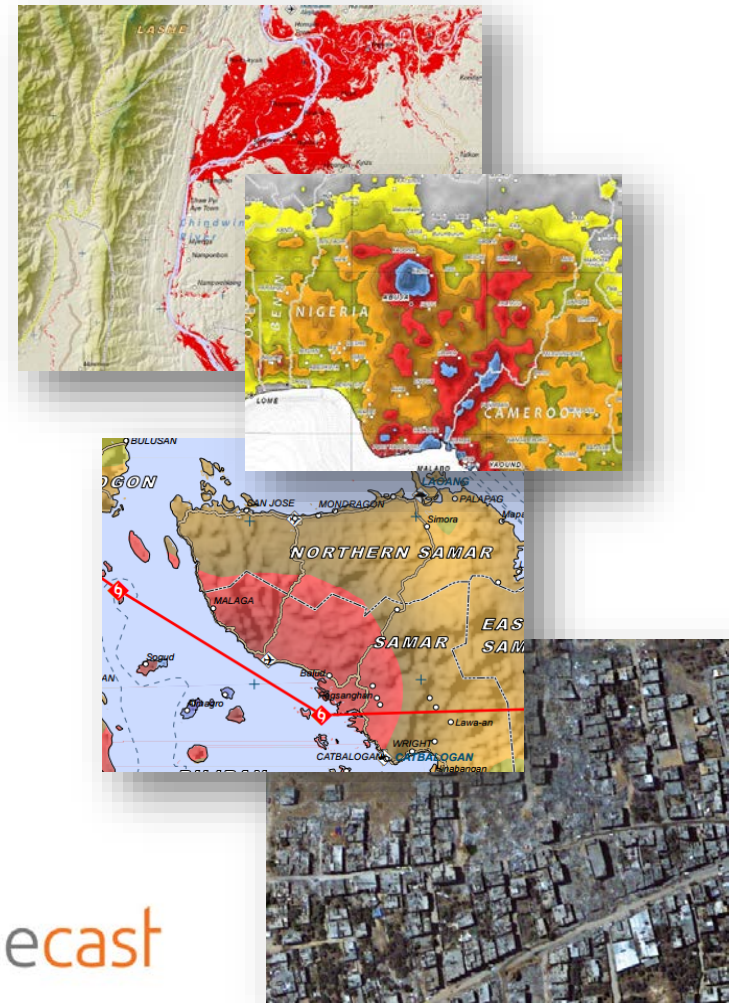




<https://www.youtube.com/watch?v=FkR3N5ktt4U>

Humanitarian Rapid Mapping

- Provides **satellite image analysis** during **humanitarian emergencies** – natural disasters and conflict-situations (Maps, GIS-ready data, statistics and reports)
- Wide range of Optical and Radar satellite imagery from commercial and scientific sensors (no military data) from very high resolution (32 cm), to low resolution (1km)
- As of today approximately 25% of humanitarian activations benefit from data delivered through the Charter. For the rest of activations UNOSAT relies on in kind contributions (i.e. EnhancedView program though US State Department) as well as from imagery funds (approx. 200k per year from donors and UN sister agencies).



UNOSAT Operational Activities: Satellite Analysis & Mapping:



Floods

Earthquakes

Cyclone

Land Slides

Refugee and Internally Displaced Persons Mapping

Cultural Heritage Sites

Conflict Damage Assessment

And so on...



24/7 365 days

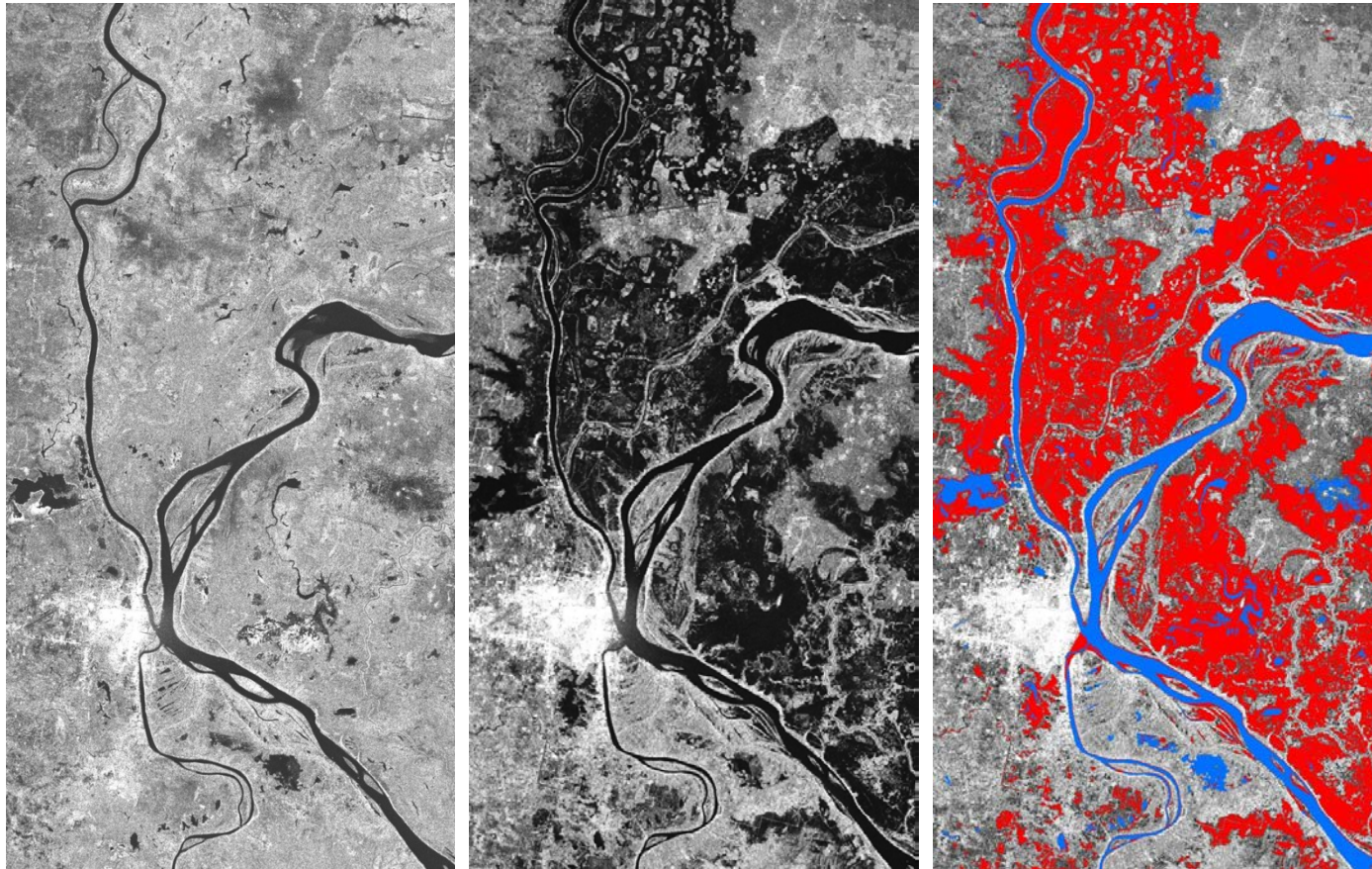


+41 75 411 4998



emergencymapping@unosat.org

Mekong River (Cambodia), 2008-floods

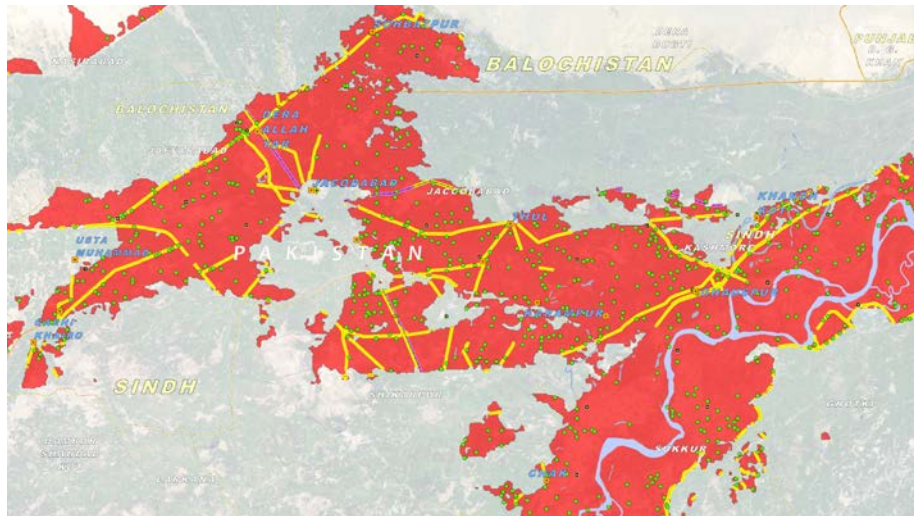
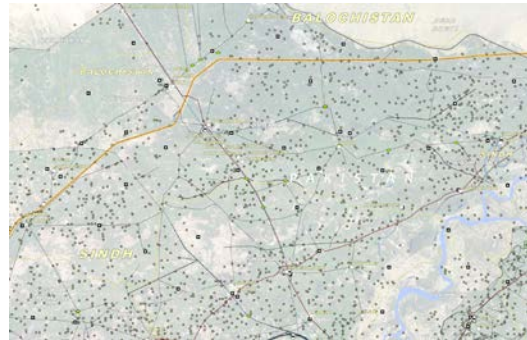


RADARSAT

Analysis Overview of Workflow

**Google
Map Maker
Data for
Pakistan**

**UNOSAT
Flood
Water
+ Analysis**



**Combination of data allows for
detailed and comprehensive
preliminary damage analysis
for country of Pakistan**

**Summary of Flood-Affected Populated Places and
Infrastructure**

Province	BALUCHISTAN	KHYBER PAKHTUNKHWA	PUNJAB	SINDH	Others	Total
Village Count	174	808	4,037	2,463	10	7,492
Towns / Cities	6	39	54	36	0	135
Health facilities	12	20	70	88	0	190
Bridges	11	183	139	95	1	429
Roads (km)	313	772	1,613	2,331	21	5,051
Railways (km)	10	27	169	199	0	406

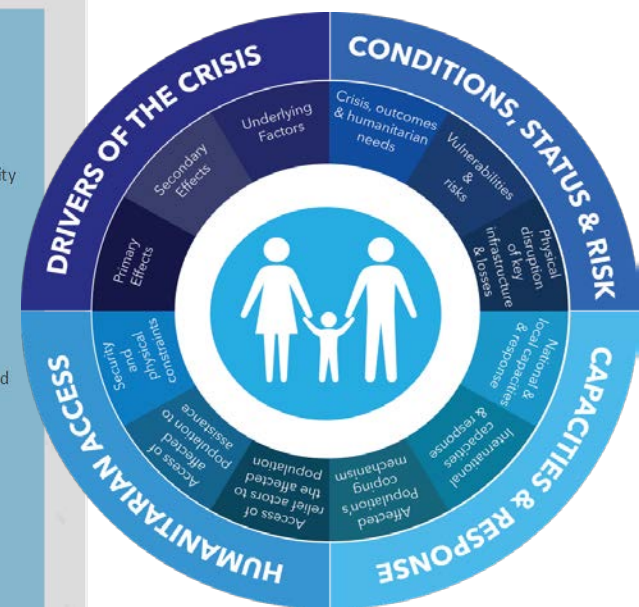
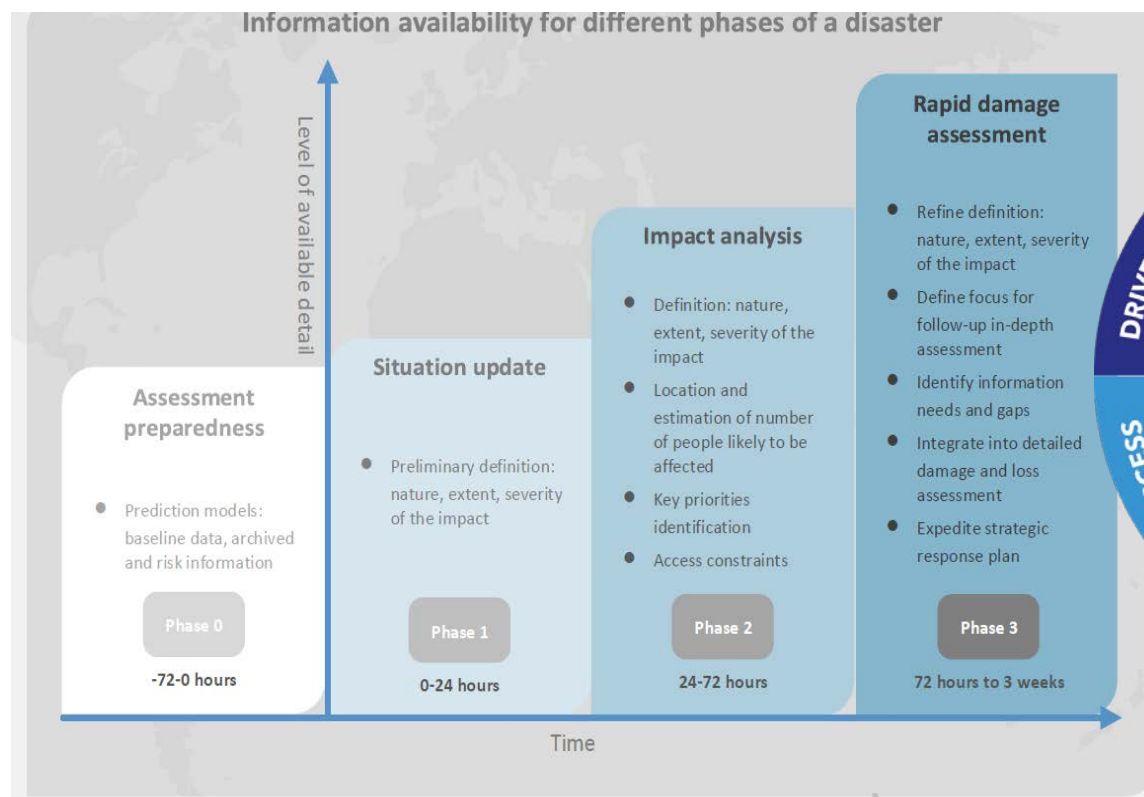
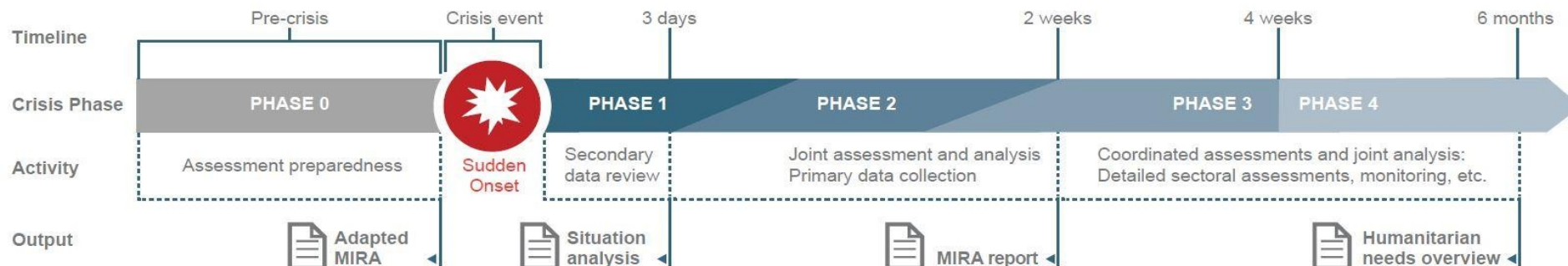


Before

After

Geospatial Information for Addressing Varying Needs for Different Phases of Disaster

Catalogue of Geospatial Products to support humanitarian Programme Cycle





CATALOGUE OF SATELLITE DERIVED INFORMATION: FLOOD

TIMELINE	Preparedness Phase 0 (Pre Disaster)	Preliminary Situation Analysis Phase 1 (24hrs)	Situation Analysis Phase 1 (72hrs)	Initial Rapid Assessment Phase 2 (2 weeks)
ANALYSIS CATEGORY	Potential Flood Scenario	Precipitation Analysis Preliminary Flood Impact	Flood Impact	Flood Monitoring & Flood Assessment
DERIVED INFORMATION	<ul style="list-style-type: none"> Flood Alert / Early Warning (* Flood Finder) Simulated Flood Water Scenario (* Flood Finder) Archived Satellite Detected Flood Event Identification of river network and watershed delineation and conditioned DEMs 	<ul style="list-style-type: none"> Spatial and temporal distribution of estimated precipitation accumulation (daily / monthly / yearly) Spatial and temporal distribution of precipitation anomalies (monthly / yearly) Potentially affected population by precipitation anomalies (monthly / yearly) (*Large Scale Satellite detected flood water extent (Ha/sq. km)) 	<ul style="list-style-type: none"> Regional / Local Scale Satellite detected flood water extent (Ha/sq. Km) Percentage of standing flood water by administrative unit Percentage of standing flood water by predominant landcover types (rural/urban/agriculture/vegetation, etc.) Estimated affected population living within flood affected areas by administrative units Estimated number of populated places (cities, towns, villages) within flood affected areas Estimated number of IDP sites within flood affected areas Estimated number of critical facilities & transportation network within flood areas 	<ul style="list-style-type: none"> Detailed Cumulative Flood Extent by administrative unit Monitoring and evolution of flood event Flood damage and risk assessment (from hazard models calibrated with satellite observed flood extent)
MIRA	<ul style="list-style-type: none"> Flood Preparedness Early Warning Contingency Planning 	<ul style="list-style-type: none"> Preliminary definition, nature, extent, severity of the impact 	<ul style="list-style-type: none"> Definition, nature, extent, severity of the impact Location & Estimation of number of people likely to be affected Key Priorities identification Access constraints 	<ul style="list-style-type: none"> Define focus for follow-up in-depth assessment Identify information Gaps & Needs Integrate into detailed damage & loss assessment Expedite strategic response plan

Floods

Earthquakes

Cyclones

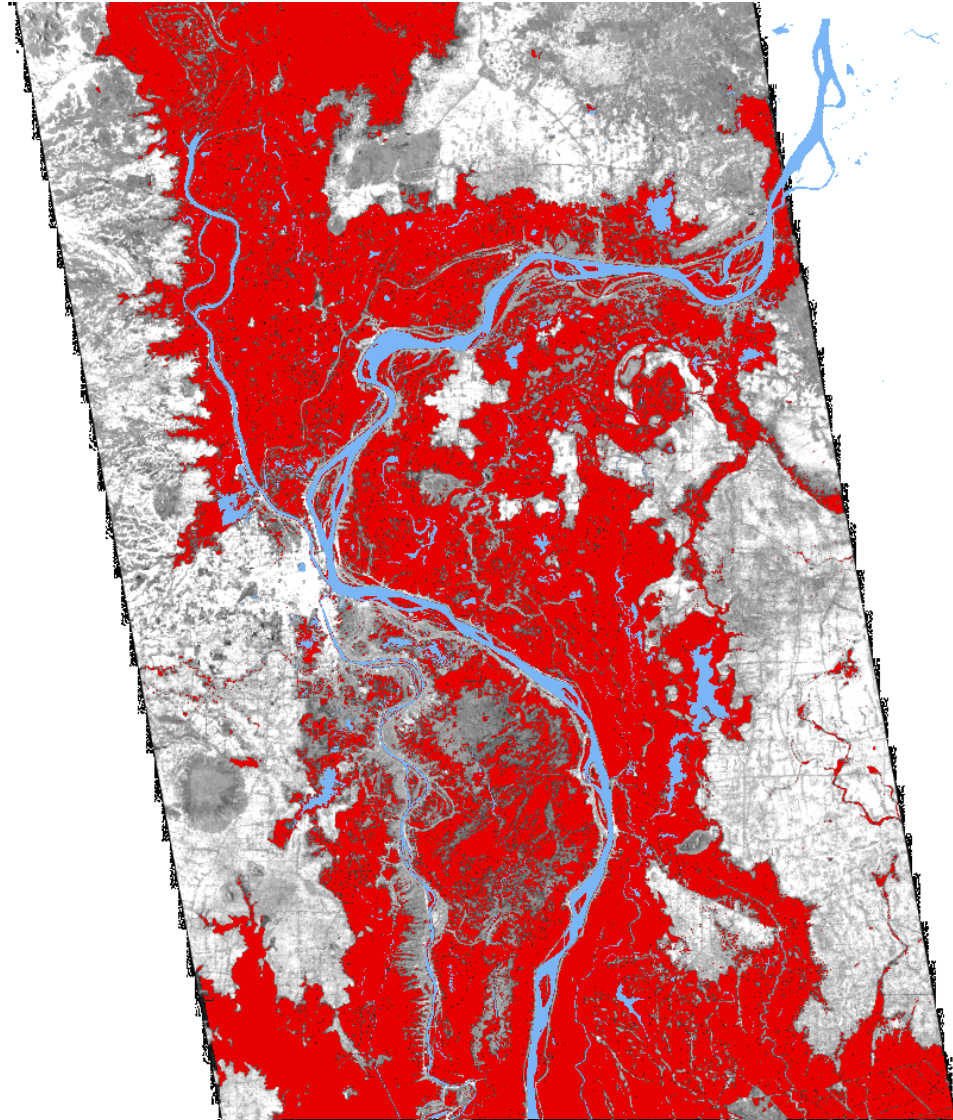
Land Slides

Refugees and
Internally Displaced
Persons Mapping

Cultural Heritage
Sites

Conflict Damage
Assessments

And so on..



Earthquake Damage Assessment

Floods

Earthquakes

Cyclones

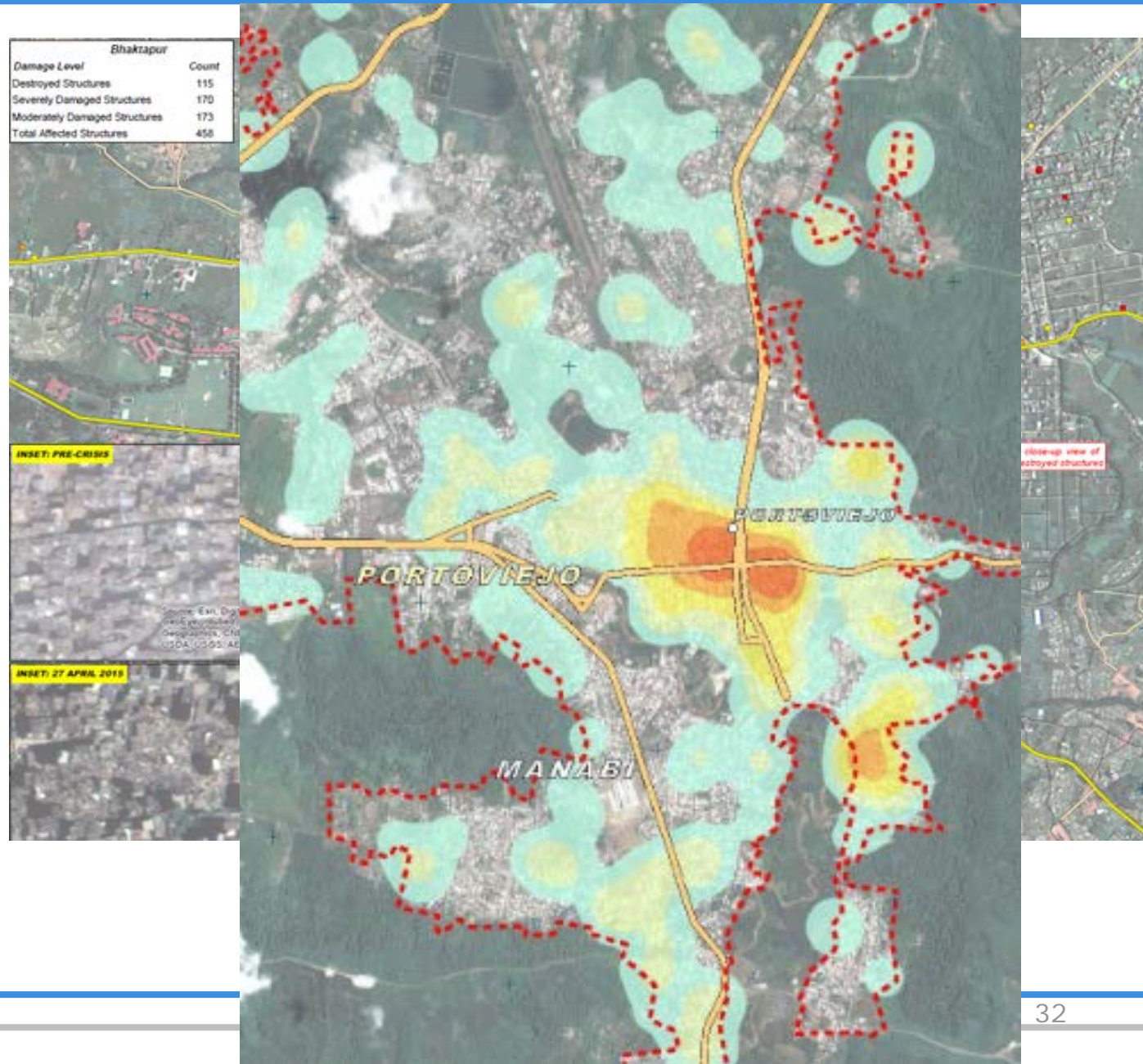
Land Slides

Refugees and
Internally Displaced
Persons Mapping

Cultural Heritage
Sites

Conflict Damage
Assessments

And so on..



Landslide

Floods

Earthquakes

Storms/Cyclones

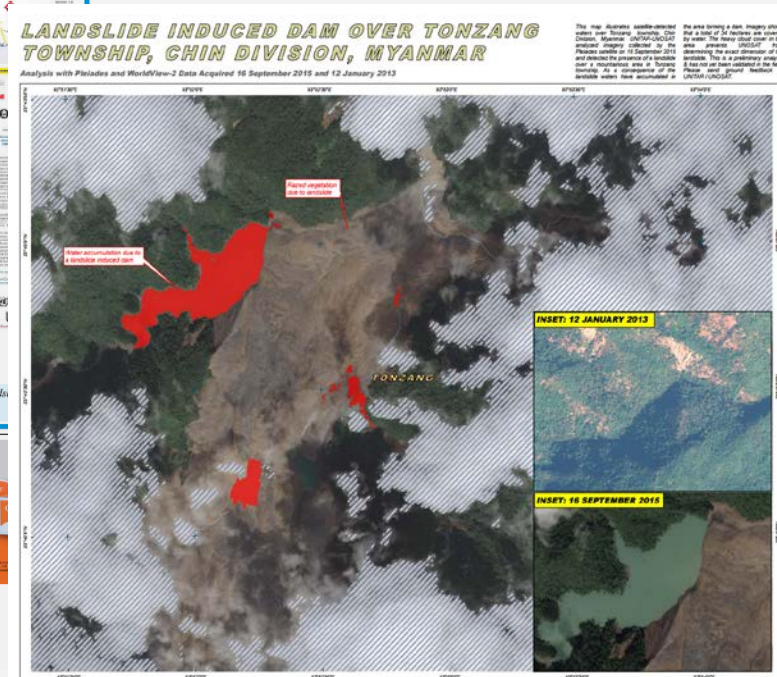
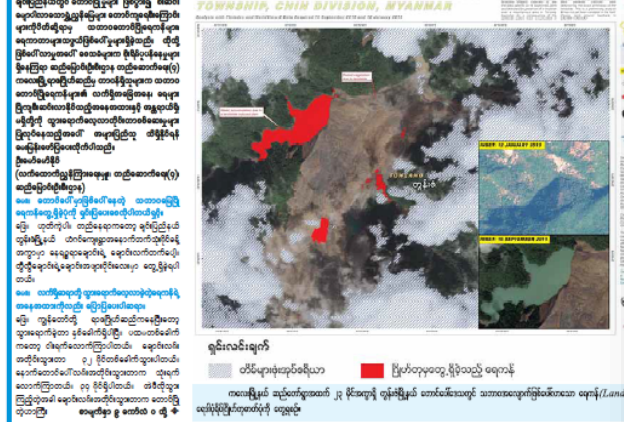
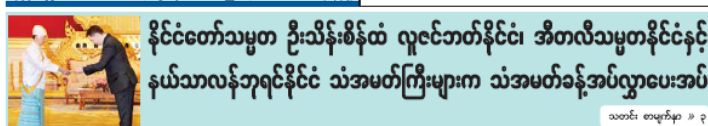
Land Slides

Refugees and Internally Displaced Persons Mapping

Cultural Heritage Sites

Conflict Damage Assessments

And so on..



"It is an invaluable information to us and to the government departments.

The Ministry of Information published about it on daily news paper and now the Irrigation department has sent their team for ground survey."
UNDP Myanmar

Refugee Camp – Iraq 2013

Floods

Earthquakes

Storms/Cyclones

Land Slides

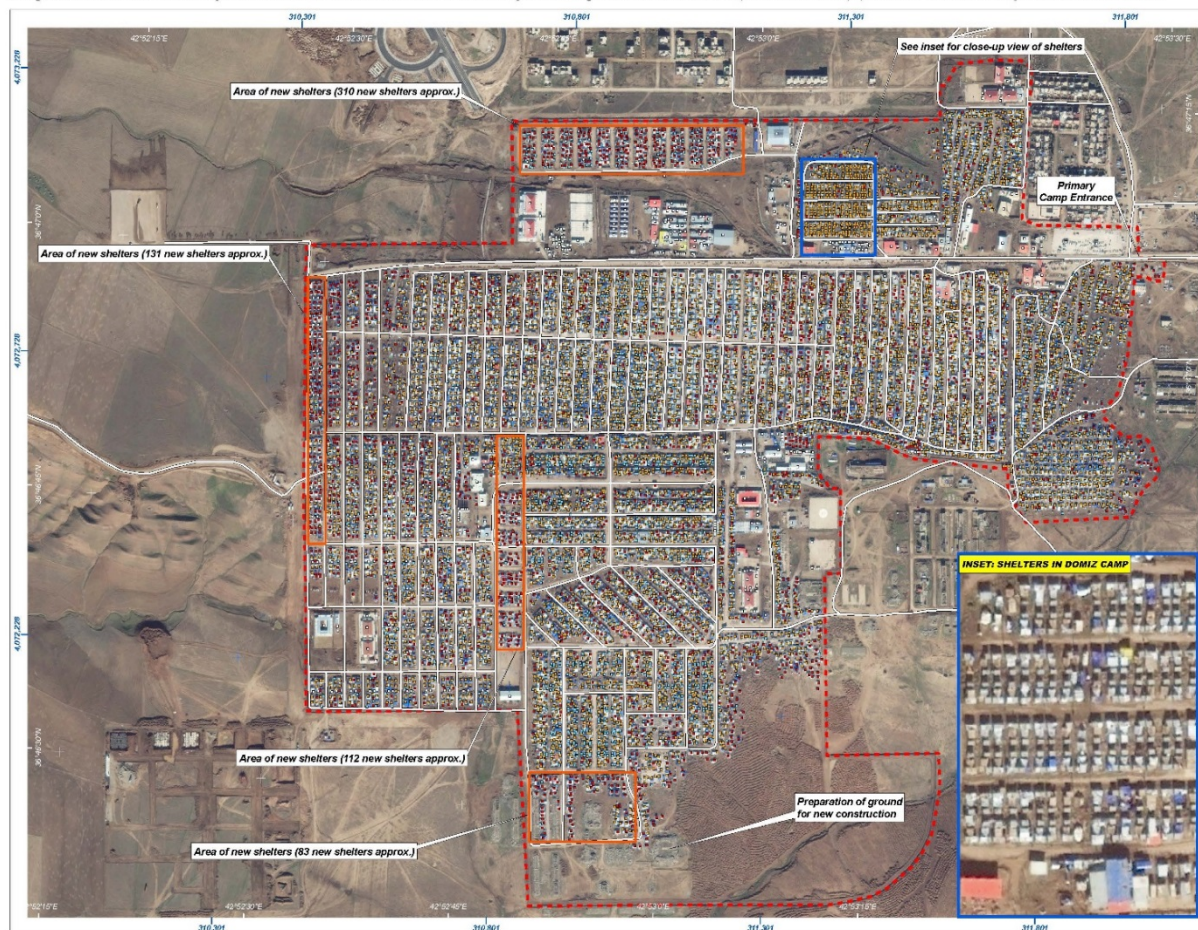
Refugees
and
Internally
Displaced
Persons
Mapping

Cultural Heritage
Sites

Conflict Damage
Assessment

DOMIZ REFUGEE CAMP, DUHOK GOVERNORATE, IRAQ

Analysis with WorldView-2 Data Acquired 25 December 2013 and WorldView-1 Data Acquired 21 July 2013



Refugee Camp



Production Date:

09/01/2014

Version 1.0

Activation Number:

CE-2013-0804-SYR



LEGEND

- Shelter structure (25 December 2013)
- Shelter structure (21 July 2013)
- Improvised shelter structure
- Camp infrastructure building
- Roads
- Total Camp Extent

Map Scale for A3: 1:6,500

0 25 50 100 150 200 Meters

Satellite Data (1): WorldView-2
Imagery Dates: 25 December 2013
Resolution: 30 cm
Copyright: DigitalGlobe, Inc.
Source: US Department of State, Humanitarian Information Unit
Satellite Data (2): WorldView-1
Imagery Dates: 21 July 2013
Resolution: 50 cm
Copyright: DigitalGlobe, Inc.
Source: US Department of State, Humanitarian Information Unit, NonVigil License
Analysis: UNITAR / UNOSAT
Production: UNITAR / UNOSAT
Analysis conducted with ArcGIS v10.1
Coordinate System: WGS 1984 UTM Zone 38N
Projection: Transverse Mercator
Datum: WGS 1984
Units: Meter

The depiction and use of boundaries, geographic names and related data shown here are not warranted to be error-free nor do they imply official endorsement or acceptance by the United Nations. UNOSAT is a program of the United Nations Institute for Training and Research (UNITAR), providing satellite imagery and related geographic information, research and analysis to UN Humanitarian and development agencies and their implementing partners.

This work by UNITAR/UNOSAT is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.



UNOSAT

Contact information: unosat@unitar.org
24/7 Hotline: +41 76 487 4998
www.unitar.org/unosat

Damage Assessment – Syria 2015

Floods

Earthquakes

Storms/Cyclones

Land Slides

Refugees and

Internally

Displaced

Persons Mapping

Cultural Heritage

Sites

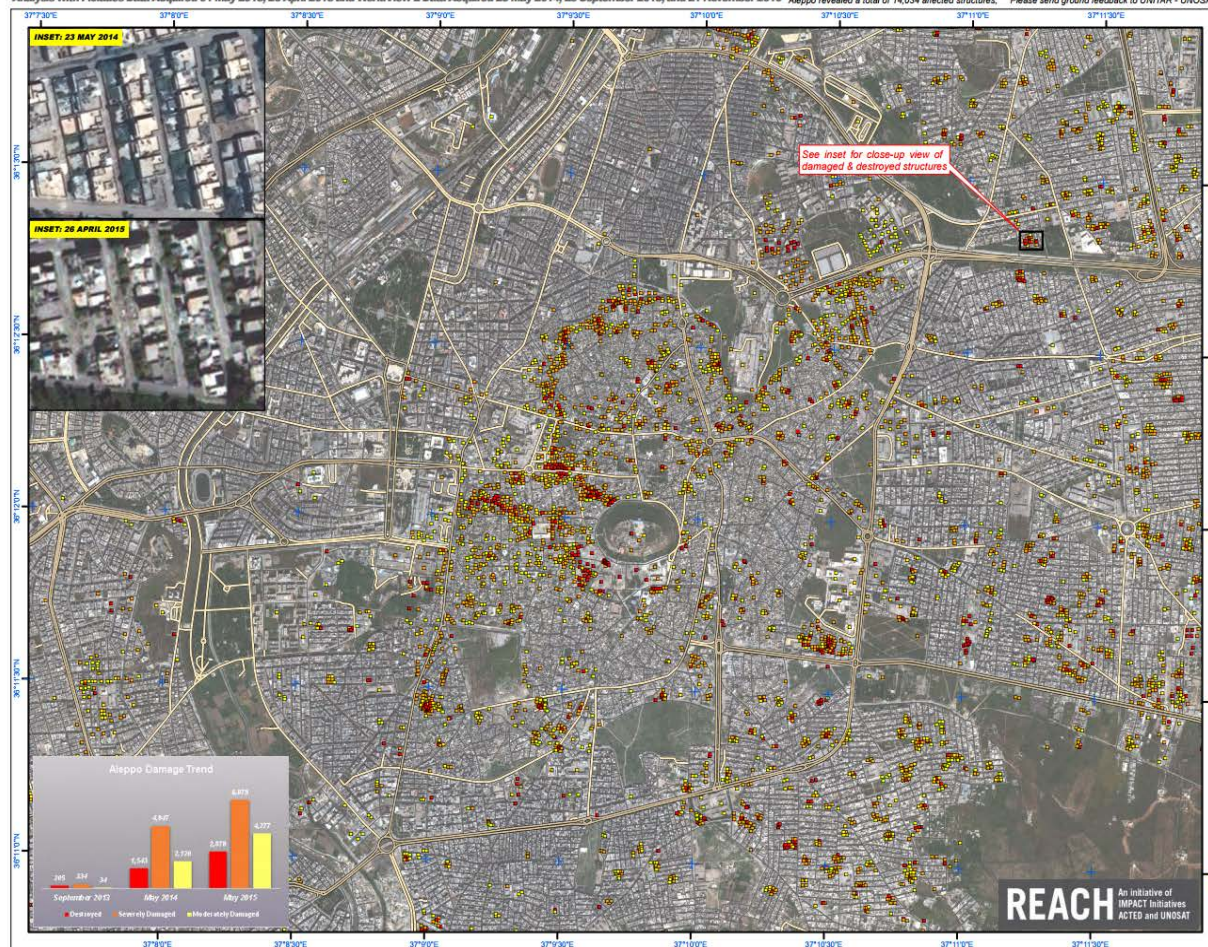
Conflict

Damage

Assessment

DAMAGE ASSESSMENT OF ALEPPO, ALEPPO GOVERNORATE, SYRIA

Analysis with Pleiades Data Acquired 01 May 2015, 26 April 2015 and WorldView-2 Data Acquired 23 May 2014, 23 September 2013, and 21 November 2010



Complex
Emergency



Production Date:

7/10/2015

Version 1.0

Activation Number:

CE20130604SYR



LEGEND

- Destroyed
- Severely Damaged
- Moderately Damaged
- Highway / Primary Road
- Secondary Road
- Local / Urban Road

Map Scale for A3: 1:20,000

Satellite Data (1): Pleiades
Imagery Dates: 01 May 2015 & 26 April 2015
Resolution: 50 cm
Copyright: © CNES (2015), Distribution AIRBUS DS
Source: Airbus Defense and Space

Satellite Data (2): WorldView-2
Imagery Date: 23 May 2014, 23 September 2013 & 21 November 2010
Resolution: 50 cm
Copyright: DigitalGlobe
Source: European Space Imaging
Road Data: Google Map Maker / DSM / ESRI
Other Data: USGS, UNOSAT, NASA, NOAA
Analysis: UNITAR / UNOSAT
Production: UNITAR / UNOSAT
Analysis conducted with ArcGIS v10.3

Coordinate System: WGS 1984 UTM Zone 37N
Projection: Transverse Mercator
Datum: WGS 1984
Units: Meter

The depiction and use of boundaries, geographic names and related data shown here are not warranted to be error-free nor do they imply official endorsement or acceptance by the United Nations. UNOSAT is a program of the United Nations Institute for Training and Research (UNITAR), providing satellite imagery and related geographic information, research and analysis to UN humanitarian and development agencies and their implementing partners.

This work by UNITAR/UNOSAT is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

unitar
United Nations Institute for Training and Research

UNOSAT

Contact Information: unosat@unitar.org
24/7 Hotline: +41 76 45 49 98
www.unitar.org/unosat



- UN-ASIGN is a free **mobile app**
- It is a tool for **taking and sharing geo-tagged** photos specifically designed to work over **low bandwidth**.
- Photos, messages and other data are displayed on the **UNOSAT LIVE map**



<https://unosat.maps.arcgis.com/apps/webappviewer/index.html?id=f43d1b10e3664b8c82d06cc28e17469c>



UNOSAT Operations Dashboard - Nepal Demo

This Live Dashboard combines multiple analysis products from UNOSAT, Copernicus and other sources.

It is intended to provide an ongoing platform to view response activities in the aftermath of the earthquake with magnitude 7.5 that occurred near Pokhara, Nepal at 06:11:25.80 UTC on Apr 25.

All analysis is preliminary and has not yet been validated in the field. Please send ground feedback to UNITAR-UNOSAT. **Disclaimer:** data

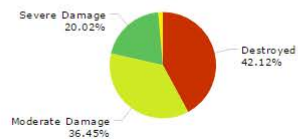
Data Sources



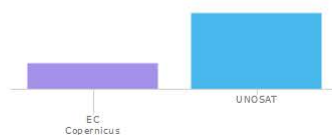
USGS Shakesmap Intensity Countours



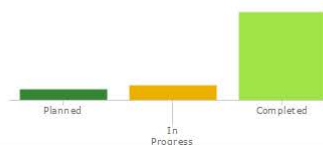
Damage Analysis: Damage Severity



GDACS-SMCS: Analysis Activity



GDACS-SMCS: Analysis Status

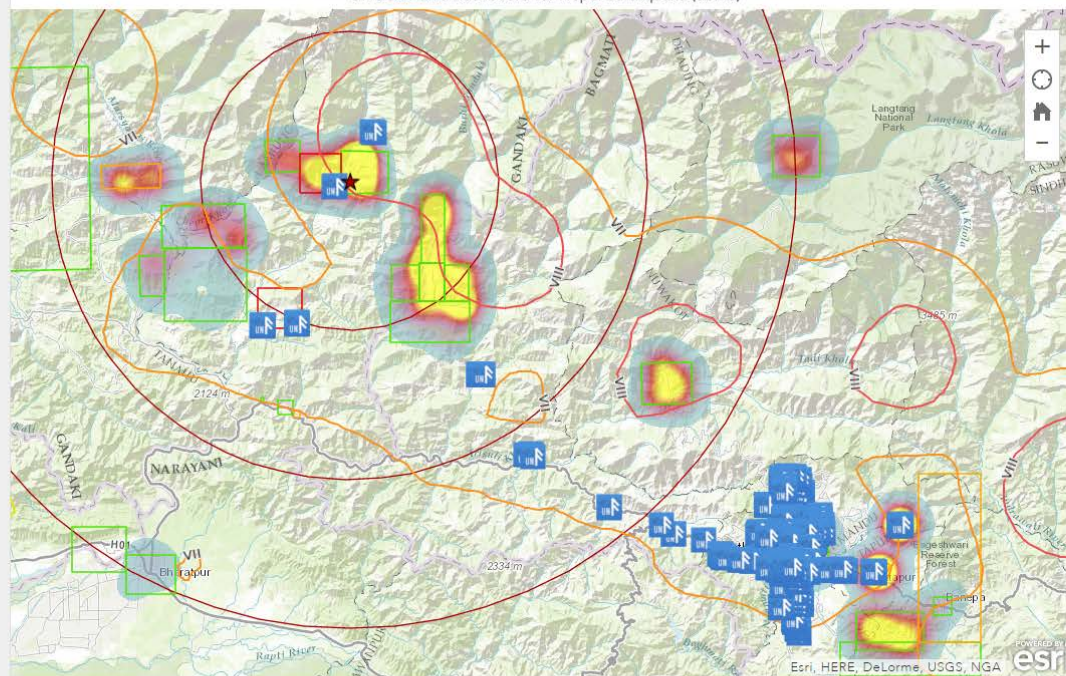


GDACS-SMCS: Latest

1 of 31
Analysis by: EC Copernicus - Created May 8, 2015

ORGANISATION EC Copernicus
DATE May 8, 2015
STATUS Completed
ACTIVITY

UNOSAT Live Dashboard for Nepal Earthquake (demo)



UNOSAT Video Widget

UN - Assign Photos

1 of 493

UN Assign Photo - 2015-05-11T09:35:30



UN-Assign Photos

Filter

2015-05-11T09:35:30 - n/a

2015-05-23T11:03:28 - n/a

OPS Chat

OBSERVE -> DECIDE -> ACT

Tropical Cyclone Winston in Fiji

(19 February 2016 – 9 March 2016)



Overview

A powerful tropical cyclone named “Winston” struck the Southern Pacific and was heading towards the coasts of Fiji. UNITAR - UNOSAT on behalf of UN OCHA activated the [International Space Charter](#) on 19 February 2016. On the 20th of February 2016, the cyclone made landfall at 06:30 UTC (18:30 local time) over the north-eastern coast of Viti Levu (Fiji), the main island of the archipelago. The cyclone tracked west across the country, causing damage in four divisions (Western, Central, Eastern and Northern) with more concerns on the Western and Central divisions.

According to [FIJI Flash Appeal Tropical Cyclone Winston](#) published by [UNOCHA](#) on 4 March 2016, 350,000 people living in the cyclone’s path could have been affected (170,000 female and 180,000 male) - equivalent to 40 per cent of Fiji’s population. This includes 120,000 children under the age of 18 (58,000 female and 62,000 male) and more than 3,100 people with disabilities.

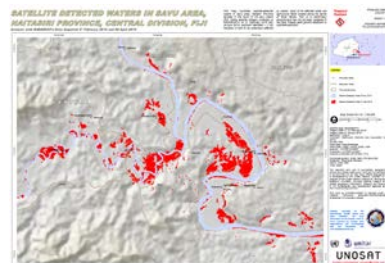
Timeline of Satellite Derived Mapping Activities

Pre

0 Hrs

Landfall

20 Feb



Assessment of standing waters.

Analysis done using radar data, extreme cloud cover

22 Feb

UNOSAT analysis- Building damage assessments were done using very high resolution satellite imagery from Pleiades (source: Airbus D&S)

Lautoka City limits



Building/Infrastructure Damage assessment products

24 Feb

09 March

19 Feb

21 Feb

23 Feb

Situational Awareness Maps

Activation of International space charter

Received first suitable set of high-resolution imagery



Situational awareness map: Forecasted track and probable population exposure

FIJI: TROPICAL CYCLONE WINSTON. FORECASTED TRACK, WIND SPEED ZONES AS OF 19 FEBRUARY 2016

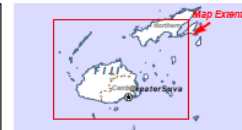
This map illustrates satellite-detected areas of Forecasted Track, Wind Speed Zones for Tropical Cyclone 11P (Winston) as of 19 February 2016. Data source: Joint Typhoon Warning Center (JTWC), Warning #26 issued at 15:00Z. This is a preliminary analysis & has not yet been validated in the field. Please send ground feedback to UNITAR / UNOSAT.

Tropical Cyclone

Production Date:
19/02/2016

Version 1.0

Activation Number:
TC20160219FJI



LEGEND

Storm Track (Winston)



Wind Speed Zone

120 Km/h

90 Km/h

Administrative Boundary

Map Scale for A3: 1:1,000,000

Storm track US Navy Joint Typhoon Warning Center
Population Data: WorldPop
Other Data: USGS, UNOSAT, NASA, NGA
Analysis: UNITAR - UNOSAT
Production: UNITAR - UNOSAT
Analysis conducted with ArcGIS v10.1

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

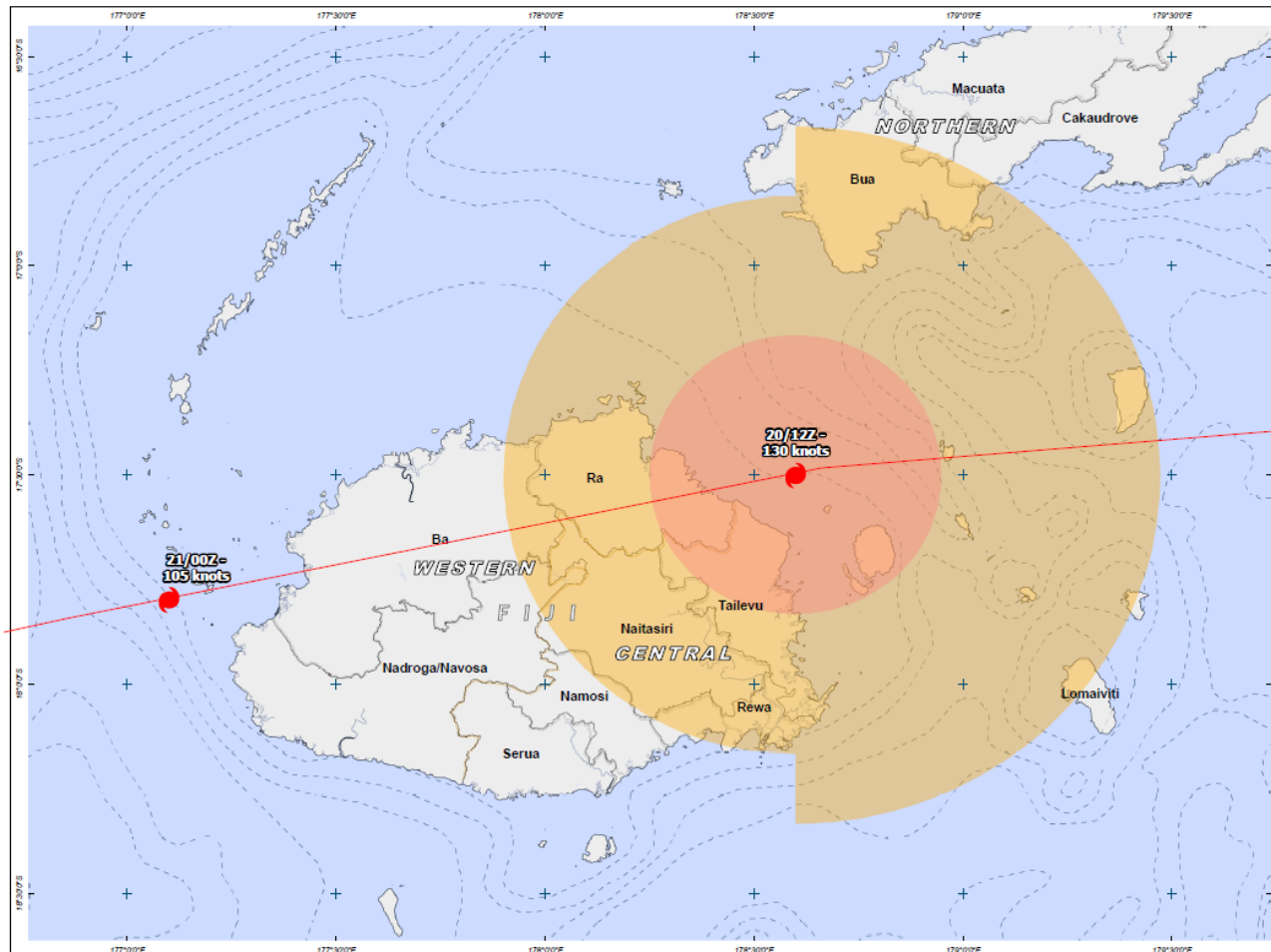
The depiction and use of boundaries, geographic names and related data shown here are not warranted to be error-free nor do they imply official endorsement or acceptance by the United Nations. UNOSAT is a program of the United Nations Institute for Training and Research (UNITAR), providing satellite imagery and related geographic information, research and analysis to UN humanitarian and development agencies and their implementing partners.

This work by UNITAR/UNOSAT is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.



UNOSAT

Contact Information: unosat@unitar.org
24/7 Hotline: +41 76 487 4999
www.unitar.org/unosat



Impact assessment map: Detected standing water from radar image

SATELLITE DETECTED WATERS IN SAVU AREA, NAITASIRI PROVINCE, CENTRAL DIVISION, FIJI

Analysis with RADARSAT-2 Data Acquired 21 February 2016 and 08 April 2015

This map illustrates satellite-detected waters in Savu area, Naitasiri Province situated in the south of Viti Levu Island (Fiji). Using satellite imagery collected by RADARSAT-2 on 21 February 2016 and 08 April 2015, UNOSAT identified ~ 1,100 hectares of land to be potentially affected

by waters. Most of the affected areas are agricultural fields located along the banks of River Rewa. This is a preliminary analysis and has not yet been validated in the field. Please send ground feedback to UNITAR-UNOSAT.

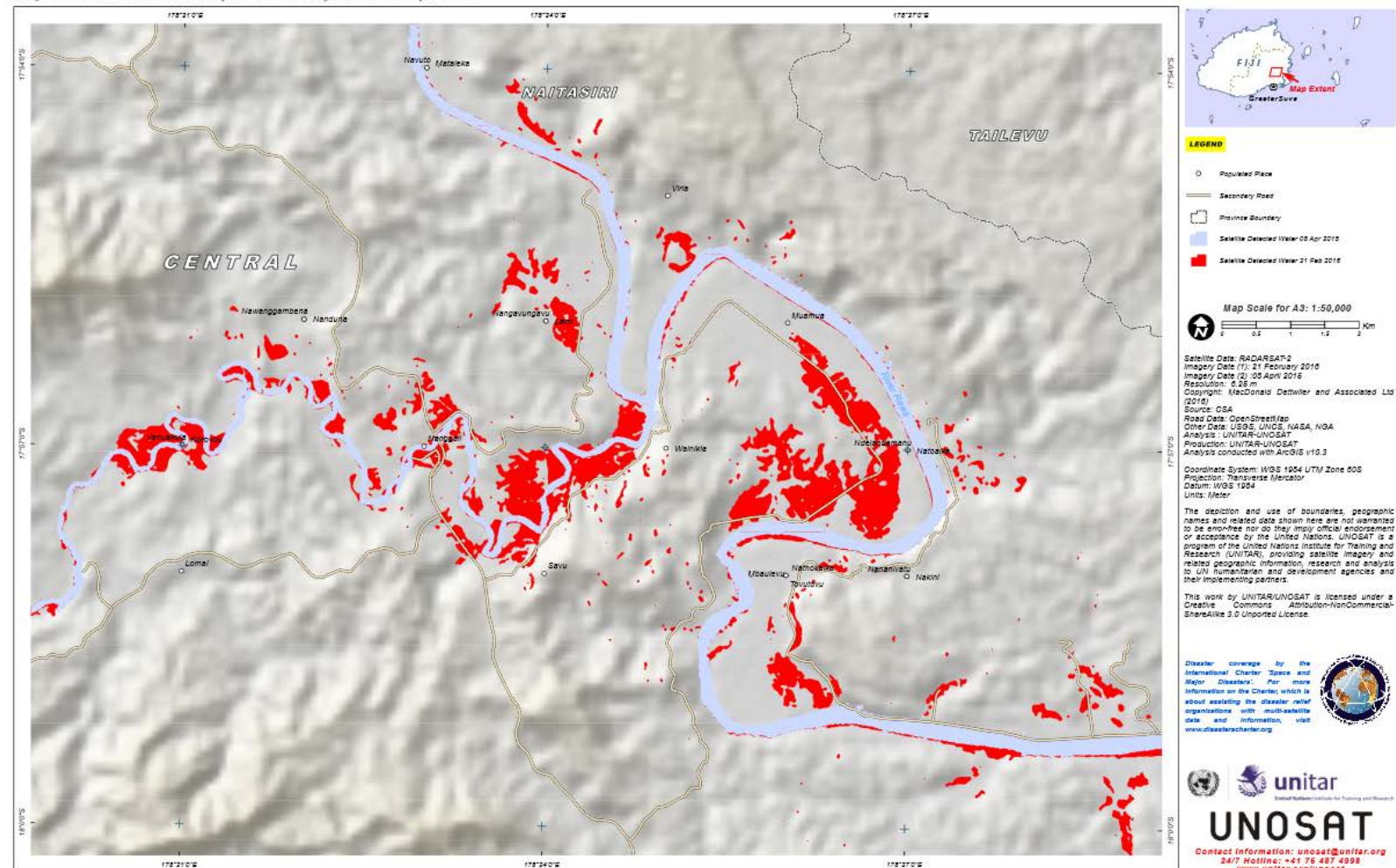
Tropical Cyclone



Production Date:
2/22/2016

Version 1.0

Activation Number:
TC-2016-000014-FJI



Damage assessment map: Detected from high resolution cloud-free satellite image

DAMAGE ASSESSMENT IN GREATER LAUTOKA AREA, BA PROVINCE, WESTERN DIVISION, FIJI

Analysis with Pleiades Data Acquired 22 February 2016

This map illustrates the damage assessment in the Lautoka city and greater area in Ba Province in the northwestern part of Viti Levu Island, Fiji, as determined by satellite imagery analysis. Using imagery acquired 22 February 2016, UNITAR-UNOSAT identified a total of 900 damaged structures, of which 433 were within the city limits. In the greater Lautoka area, 74 structures were identified to be

destroyed, 152 were severely damaged, and 674 have suffered moderate damages. These damaged structures were compared with total number of buildings/structures (~17,500) in the region and the percentage of damaged buildings across the area was estimated to be about 5%. This is a preliminary analysis and has not yet been validated in the field. Please send ground feedback to UNITAR - UNOSAT.

Tropical Cyclone

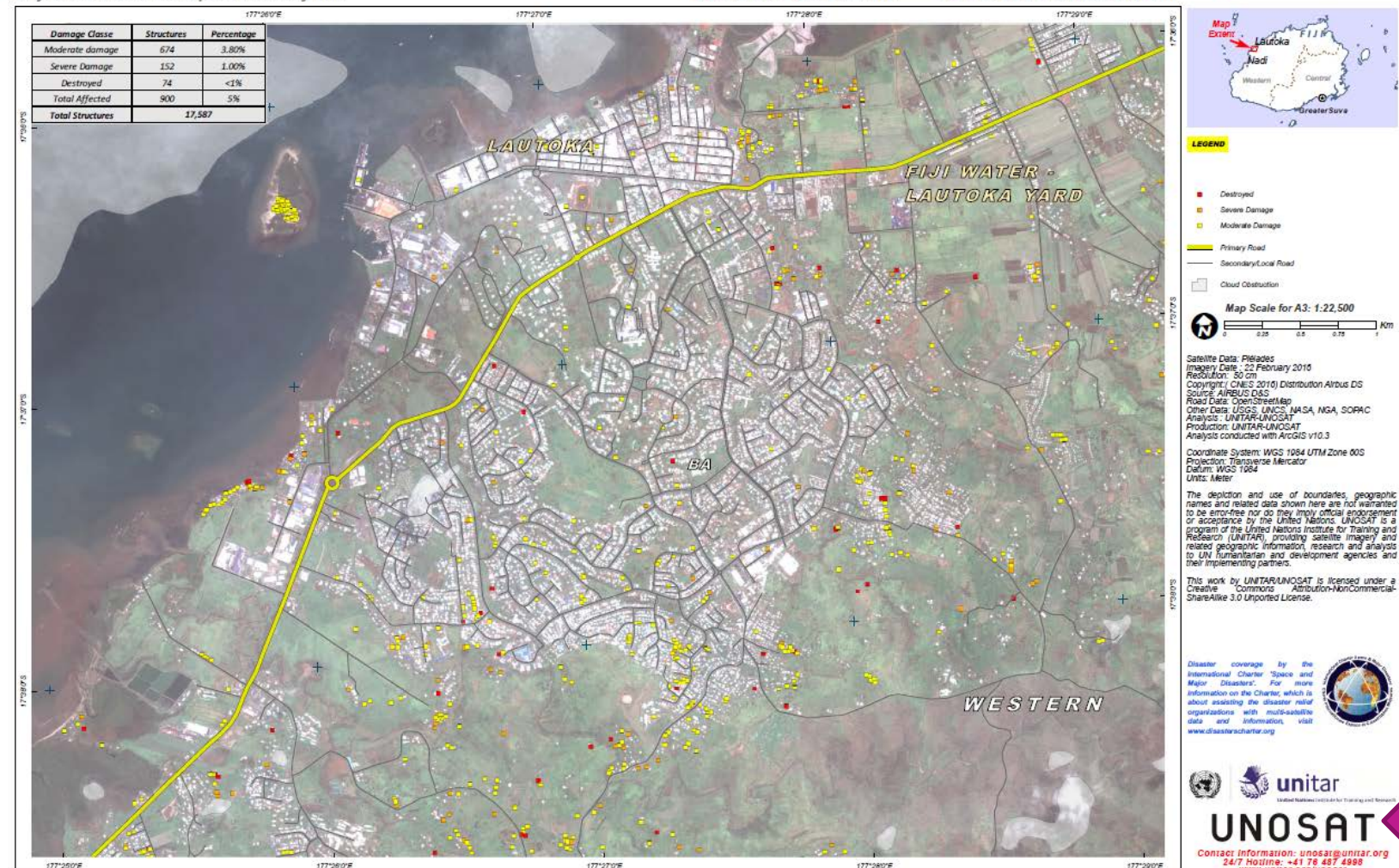


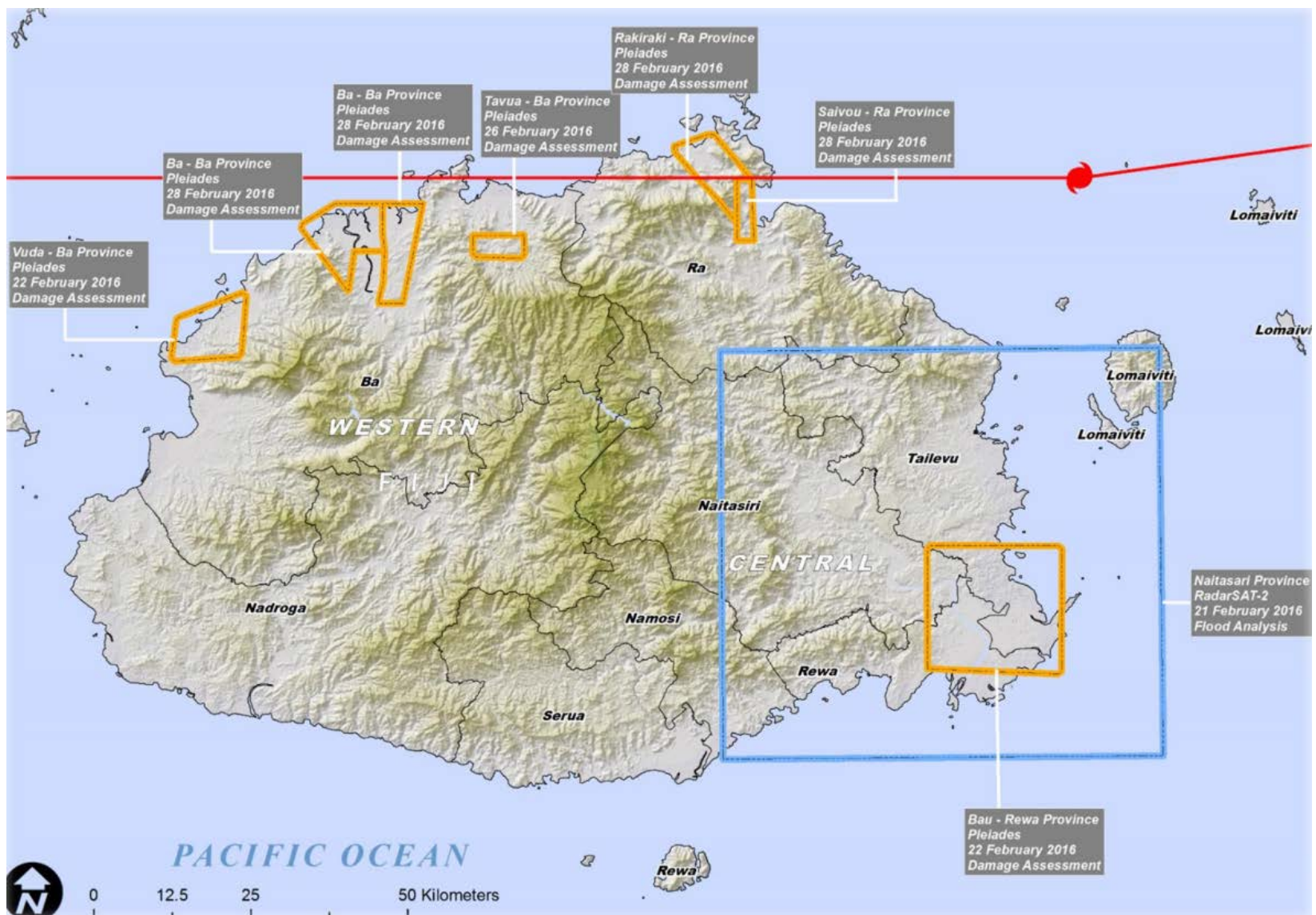
Production Date:

25/02/2016

Version 1.0

Glide: TC-2016-000014-FJI





Developing Tangible Capacities in Geospatial Information technology for Disaster Risk Reduction

Asia Capacity Development

Training & Capacity Development Activities

Master level courses

Basic and advanced courses

Capacity development programmes

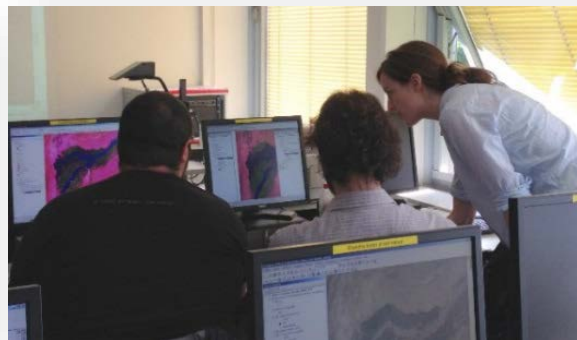
Workshops and information sharing

UNOSAT is implanting capacity development projects in collaboration with:

- [Intergovernmental Authority on Development \(IGAD\)](#) (Horn of Africa)
- [the Asian Disaster Preparedness Centre \(ADPC\)](#) (South East Asia)
- [Government of Chad](#) (Reseau Project)

Target Audience

- [Decision makers](#) and [professionals](#) from national and international organizations



UNOSAT offered an innovative capacity development approach that enables participants to master and adopt the different tools and techniques of GIT in their workflows. Following are the chronological order of activities:

A. First Technical Training

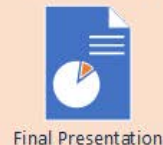
B. Selection Of A Relevant Geo-spatial Assessment Project By Participants

C. Launch Of Community Of Practice Forum

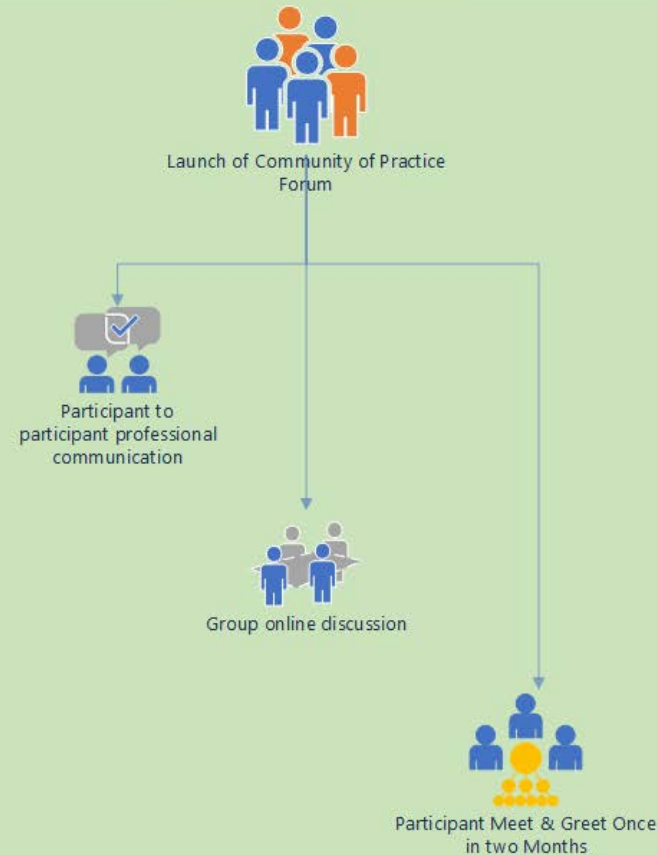
D. Final Week Of Advanced Training And Presentation Of Project

E. Handover The Community To The Participants

Capacity Development



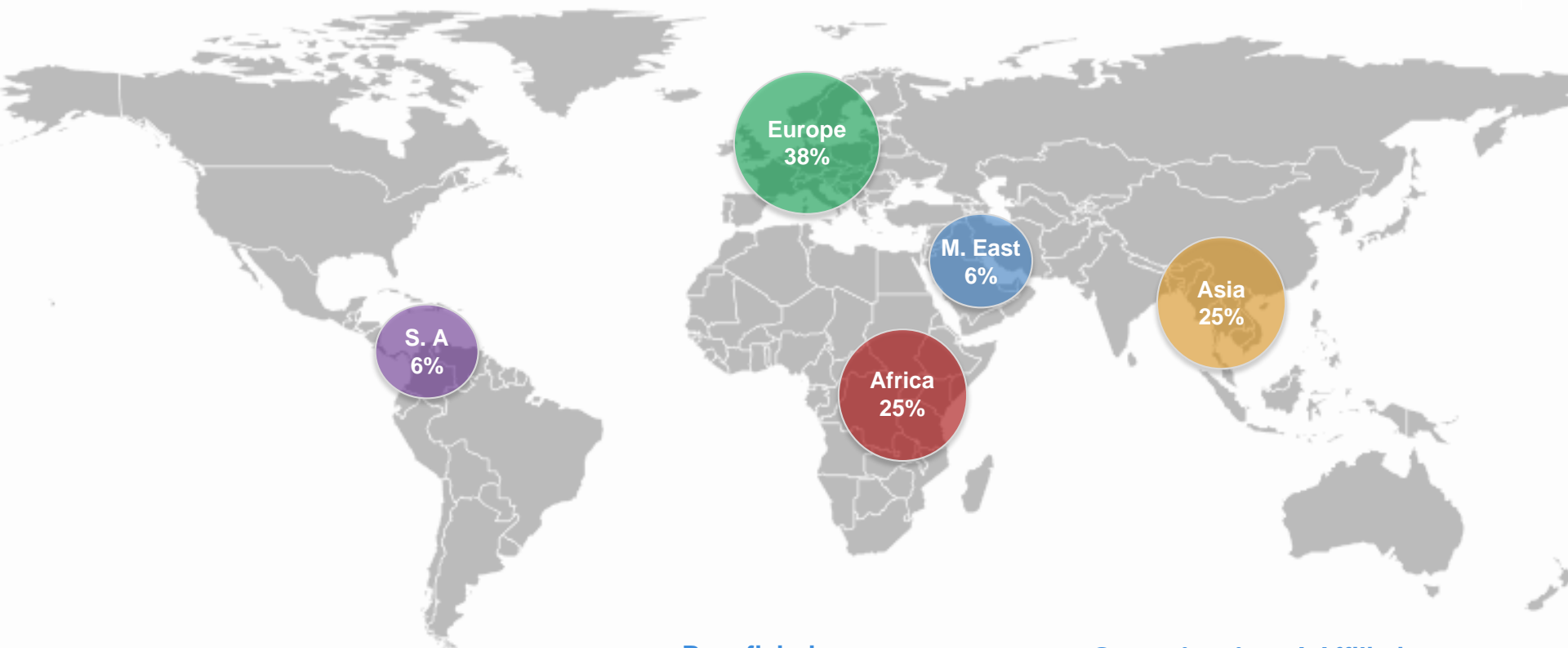
Promote Sustainability



Maintain Capacity and Ensure Ownership



UNOSAT Training and Capacity Building Beneficiaries (2006 – 2015)



Activities

Master level training
 Basic & advanced courses
 In-country capacity building programmes
 Workshops and information sharing

Beneficiaries

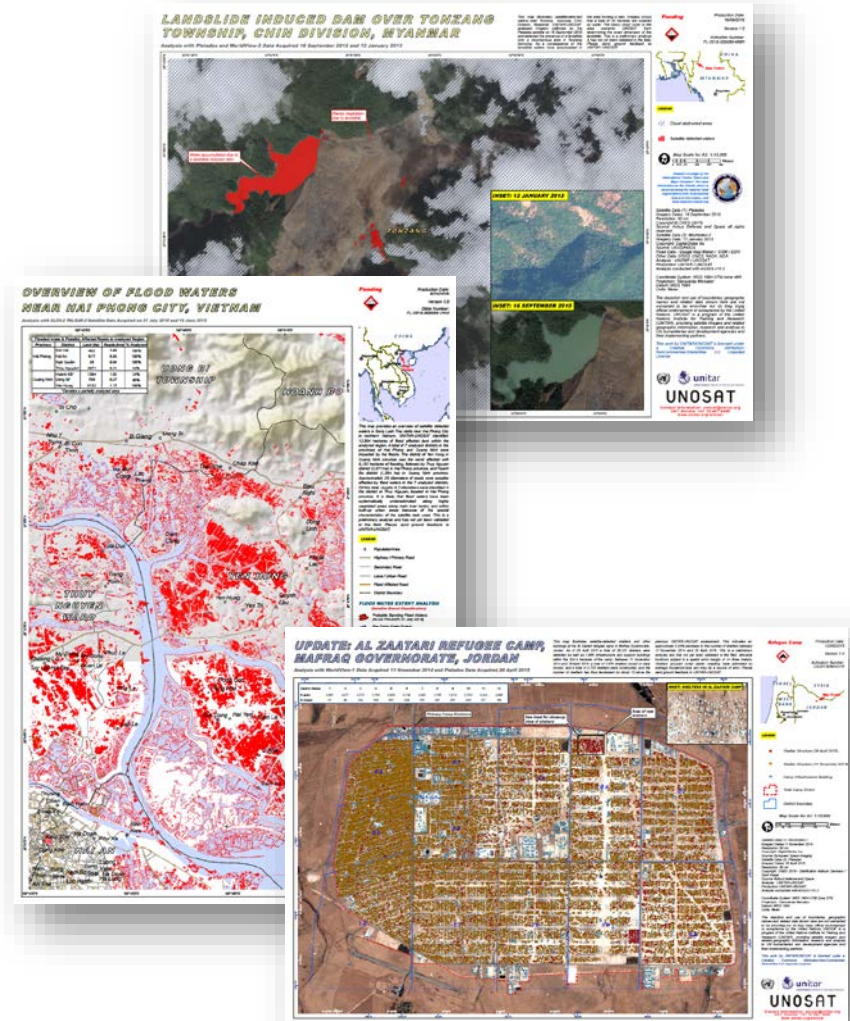


Organisational Affiliation

47% National authorities
 23% Academic
 15% NGOs
 8% Regional organisations
 7% UN system

Activating UNOSAT

- Provides **satellite image analysis** during **humanitarian emergencies** – natural disasters and conflict-situations
- Maps, GIS-ready data, statistics and reports
<https://www.unitar.org/unosat/maps>
- On call **24/7**
- Phone: **+41 76 487 4998**
- Email: emergencymapping@unosat.org



Questions???



unitar

United Nations Institute for Training and Research



United Nations Institute for Training and Research
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

Palais des Nations
1211 Geneva 10
Switzerland
T +41 22 917 8400
F +41 22 917 8047
www.unitar.org