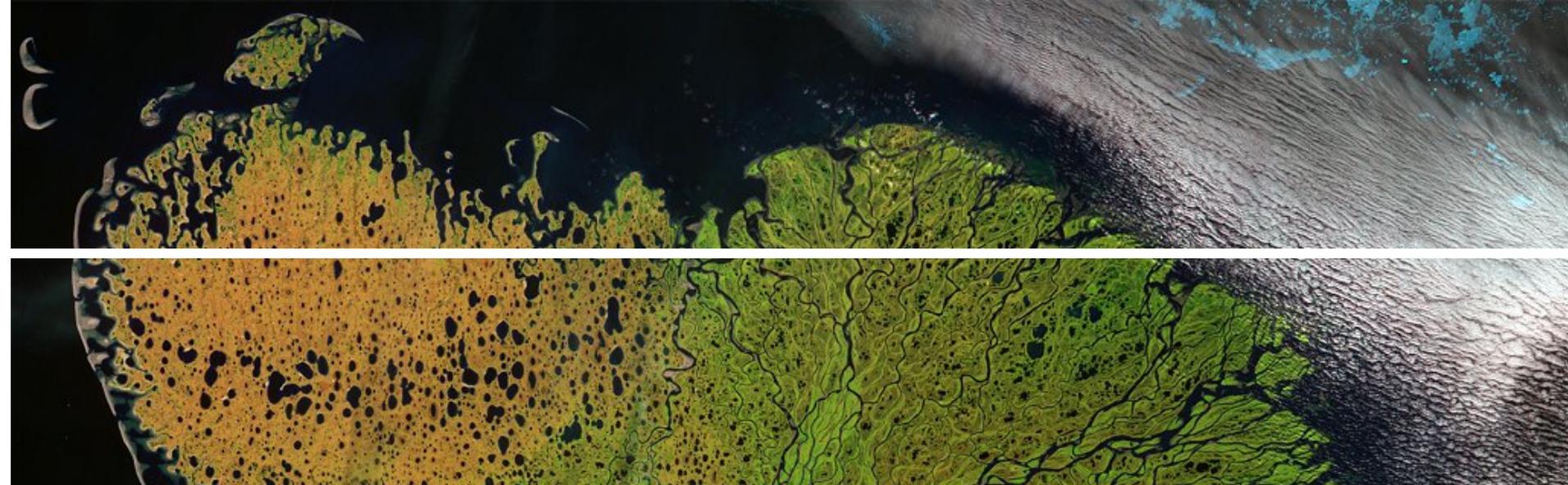


Efficient Emergency Response Using Earth Observation

29 /September / 2016

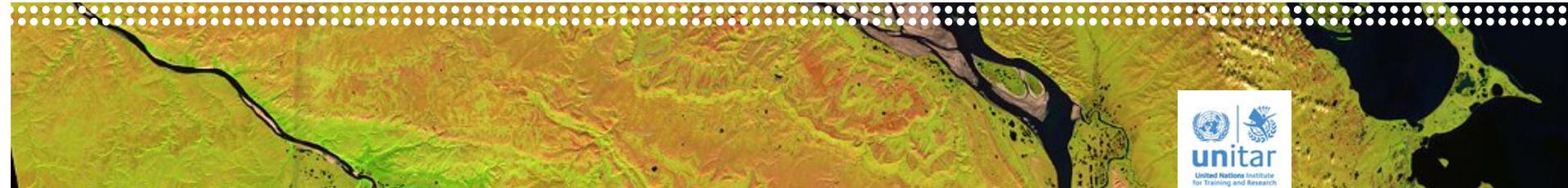
Khaled Mashfiq
Khaled.MASHFIQ@unitar.org

“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.

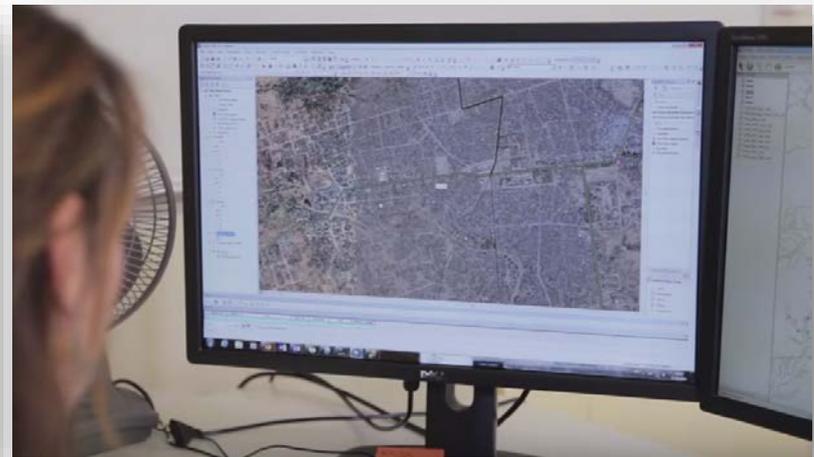
Mission

*“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

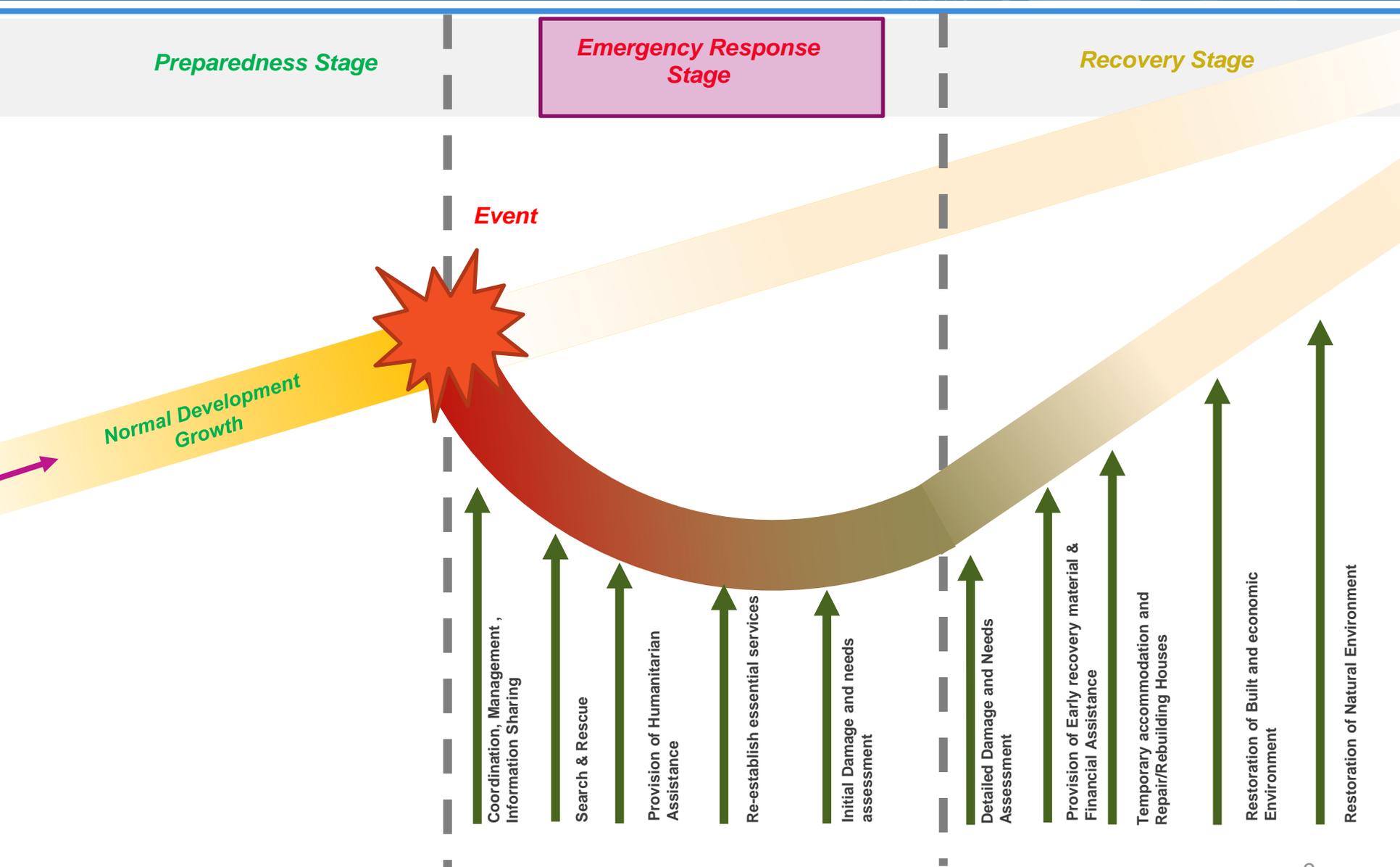
- Major Disaster & Humanitarian Framework
- Role of Geo Spatial Information in Disaster Response
- Workflow: Satellite derived analysis for emergency response
- Geospatial Information for Addressing Varying Needs for Different Phases of Disaster
- Developing Sustainable capacities

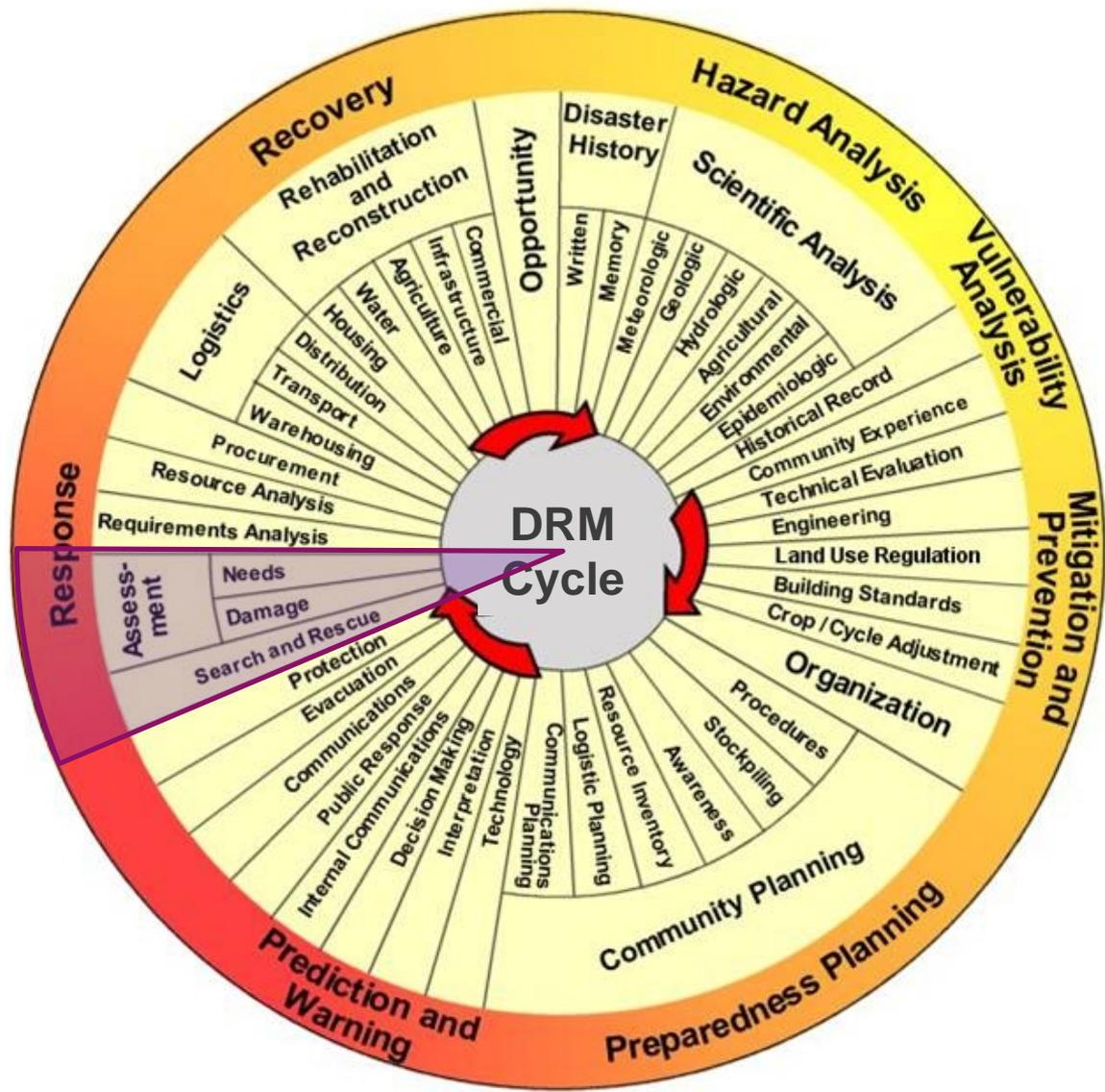
Major Disaster & Humanitarian Framework

“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

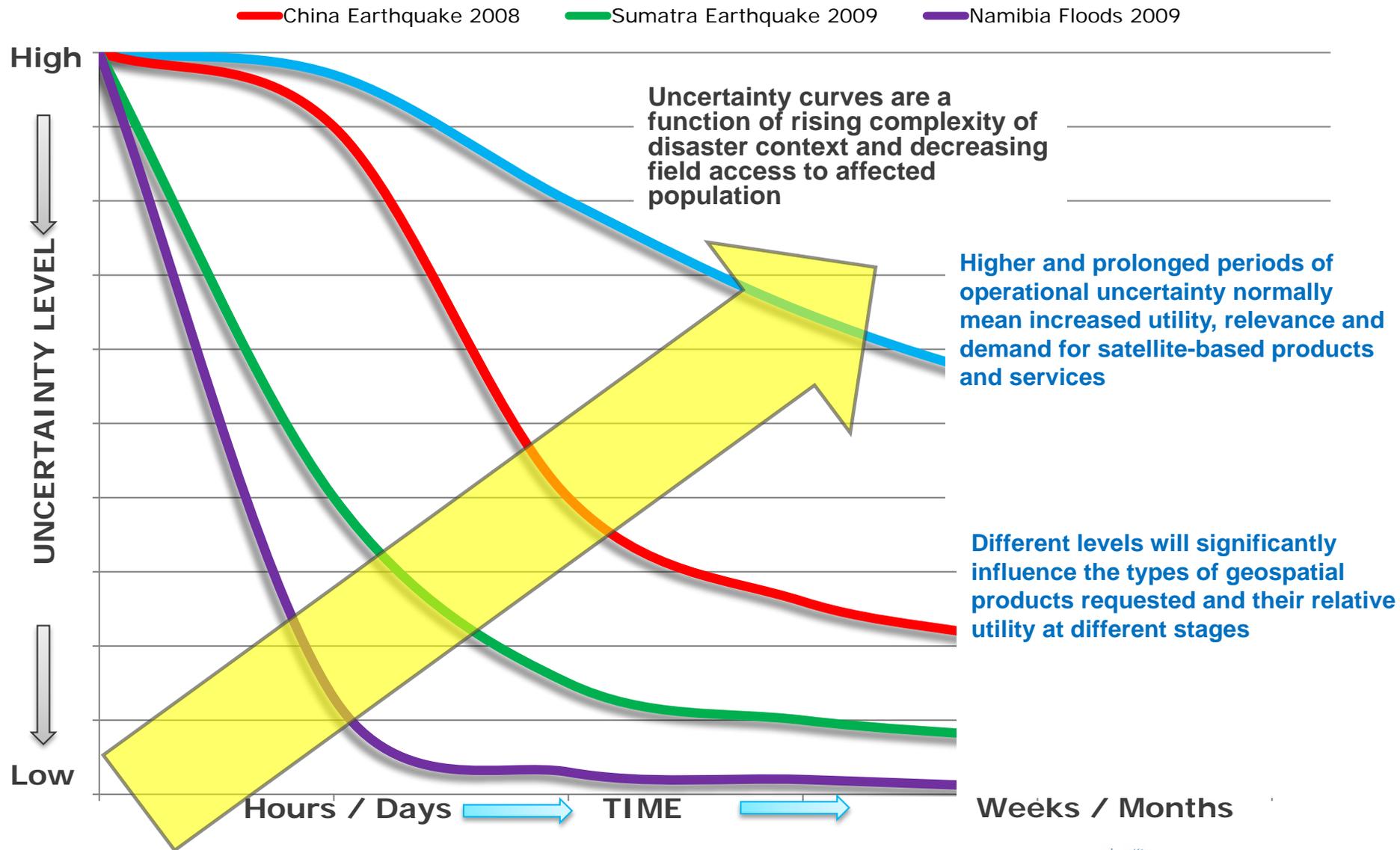




“**Fog of Disaster**” - Early stages of major disasters characterized by limited, incomplete and often contradictory information of unknown accuracy related to:

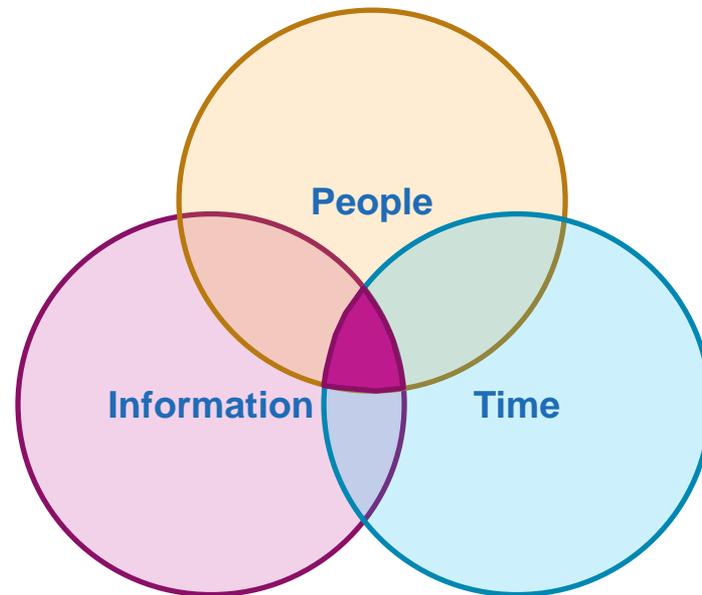
- Geographic extent of affected area(s)
- Numbers & Locations of casualties and at-risk population
- Damages to housing, infrastructure, transport facilities
- Capacity and response of local/national authorities
- Capacity and coordination of Int. humanitarian actors (3Ws Who Does What Where)

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



Role of Geo Spatial Information in Disaster Response

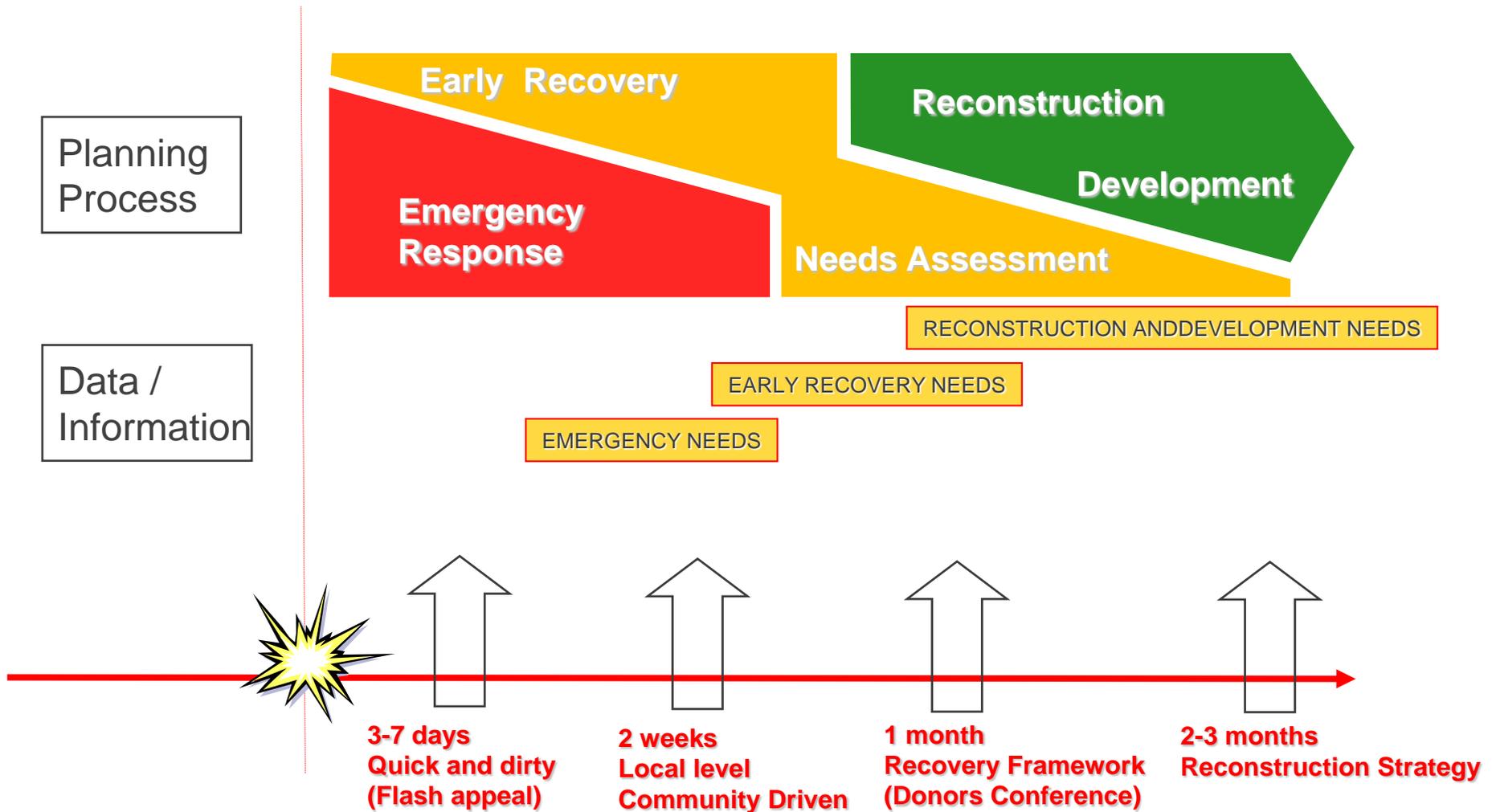
Information is the foundation on which decision-making for a coordinated and effective response is based



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.

Data and Information needs during response phase



Credits: PDNA

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, Sindh Province. 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 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 Shikarpur airport. The city of Jacobabad is severely affected with flood waters nearly surrounding the city. Route N-63, completely encircled by flood water, 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

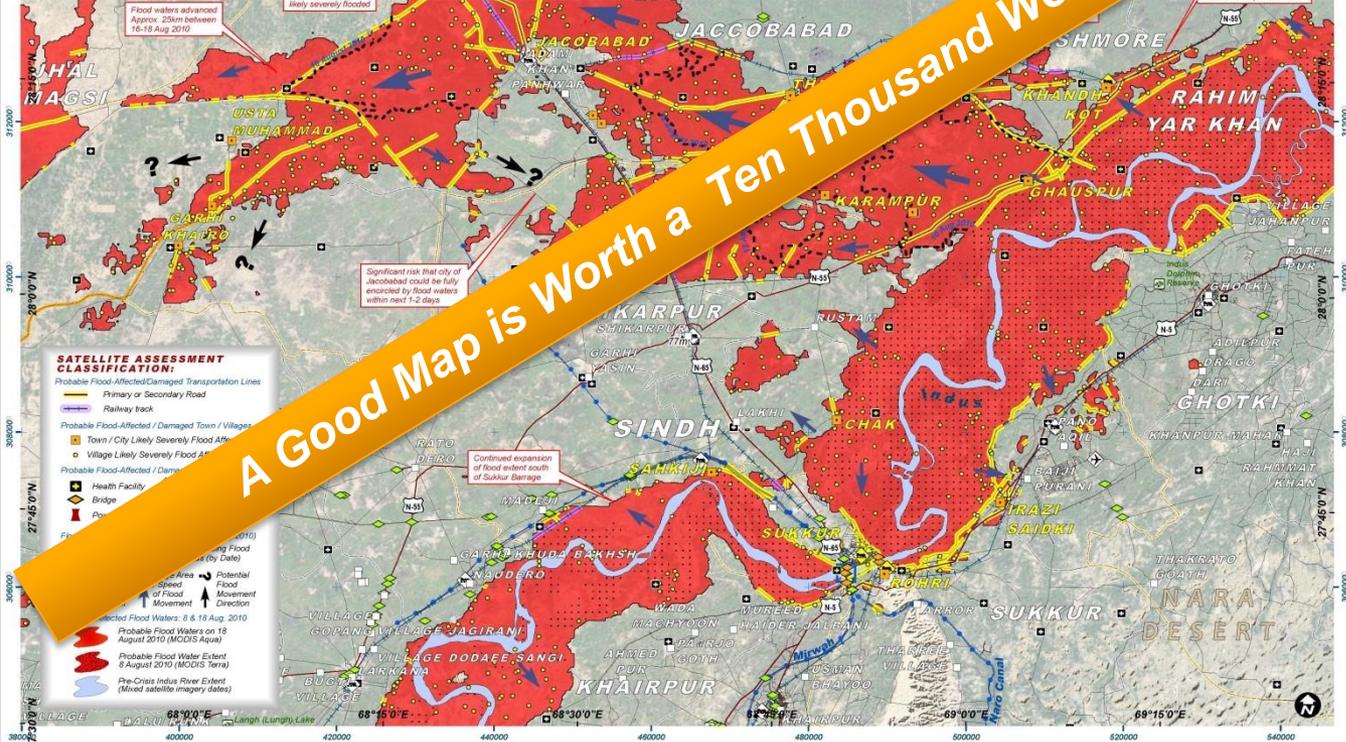


Monsoon Rains & Flooding
18 August 2010
Version 3.0
Glide No: FL-2010-000141-PAK

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	Matiari	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	28
Health Facilities (WHC)	3	1		4	1	9	3	2		4	2	34
Bridges	3		3	1		3				1		23
Roads (km)	40.3	83.2	5.0	187.9	56.0	188.3	15.8	6.2	1.0	2.7	10.5	236.5
Railways (km)	6.1			26.8	35.6	16.0				2.2		8.6

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



This map presents an updated time series analysis of the dramatic expansion of flood water outflow from the Indus River immediately north of the city of Sukkur, Sindh Province, Pakistan covering the period from 8 to 18 August 2010. This analysis is based on post-disaster satellite imagery collected by MODIS sensors from 8-18 August 2010 and RadarSat-2 data on 10 August 2010. Please note that the numbers of affected locations presented in this map represent minimum estimates because of limitations in available settlement and transportation datasets. It is certain that the numbers of affected villages, towns and affected infrastructure / transportation lines are underestimated. Also note that detected water bodies (lakes) are not included in the analysis of all flood-affected areas within the map extent. This analysis has not yet been validated in the field. Please send ground feedback to UNITAR / UNOSAT.

MAP SCALE FOR A3: 1:500,000

0 2.5 5 10 15 20 Kilometers

Legend

- Town / City
- Health Facility
- Airport / Afield
- Train station
- Barrage
- Bridge
- Protected Site
- Province Boundary
- District Boundary
- Tehsil Boundary
- Primary Road
- Secondary Road
- Railroad
- Irrigation Canal

MAP SCALE FOR A3: 1:500,000

0 2.5 5 10 15 20 Kilometers

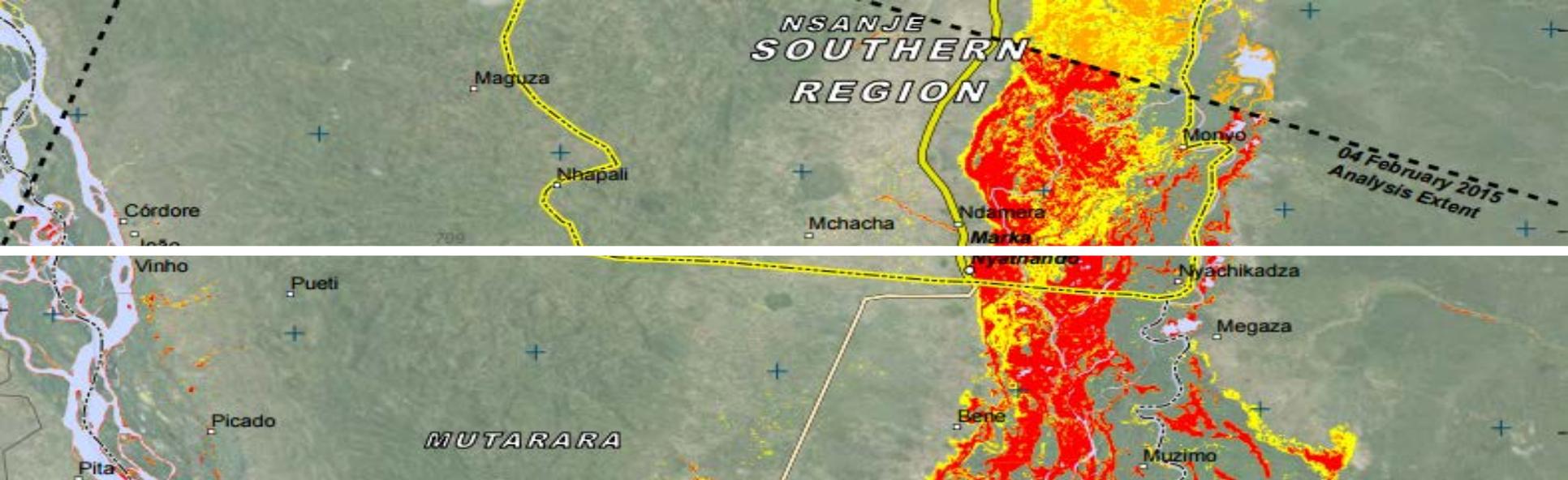
Crisis Satellite Data (1) MODIS Aqua & Terra
Resolution 250 meters
Image Date 8-18 August 2010
Source NASA Rapid Response
Crisis Satellite Data (2) RADARSAT-2
Resolution 25 meters
Image Date 8 August 2010
Copyright Radar sat 2 © MDA 2010
Source Canadian Space Agency
GIS Data NGA, OCHA, USGS, OSM
Transport Data Google Map Maker
Transport Data Copyright © 2009 Google - Improve with Google Map Maker
Relief Data UNCHC
Hospital Data WHO
Flood Analysis UNOSAT
Map Production UNITAR / UNOSAT
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

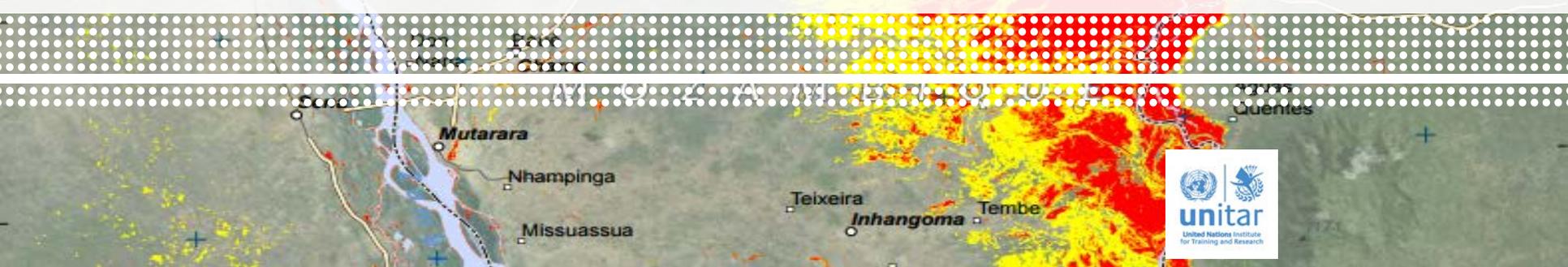
UNOSAT

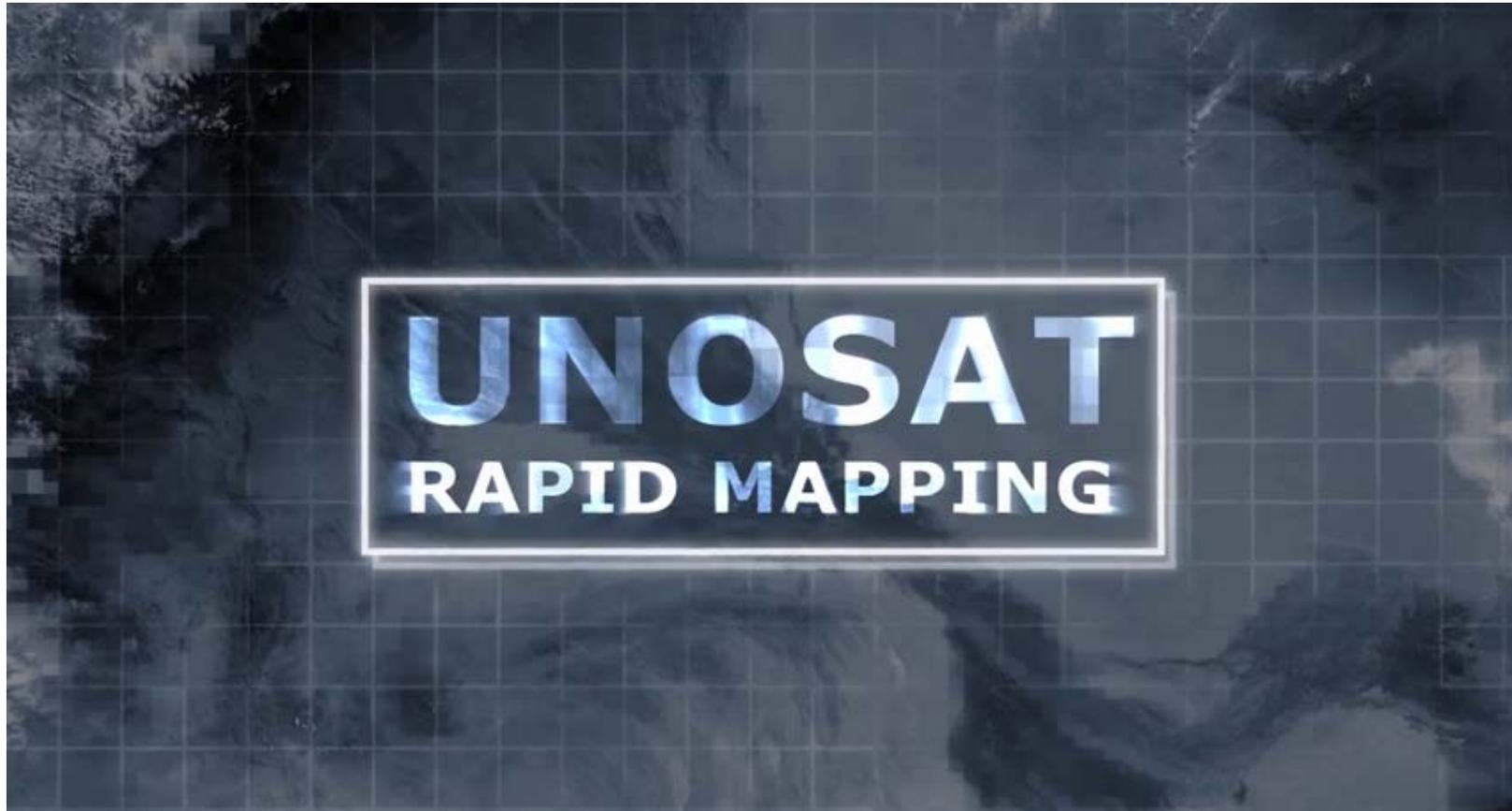
Contact Information: unosat@unitar.org
24/7 Hotline: +41 76 487 4998
www.unosat.org



Workflow: Satellite derived analysis for emergency response

www.unitar.org/unosat/rapid-mapping

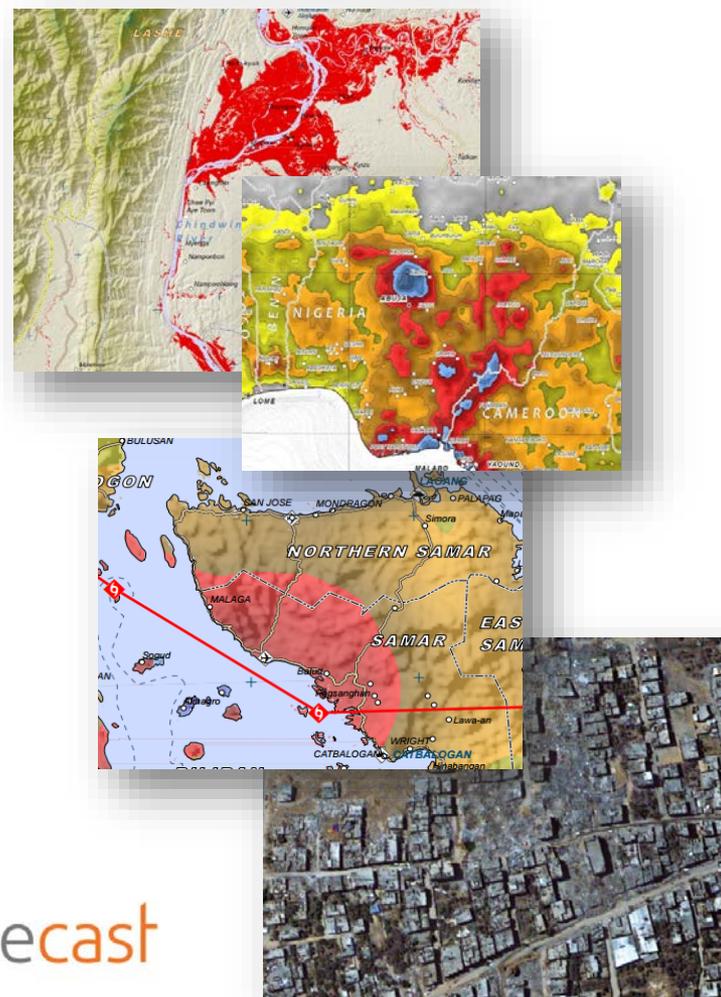




<https://www.youtube.com/watch?v=FkR3N5ktt4U>

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...

UNOSAT Rapid Mapping group is available on call 365 days 24/7



24/7 365 days

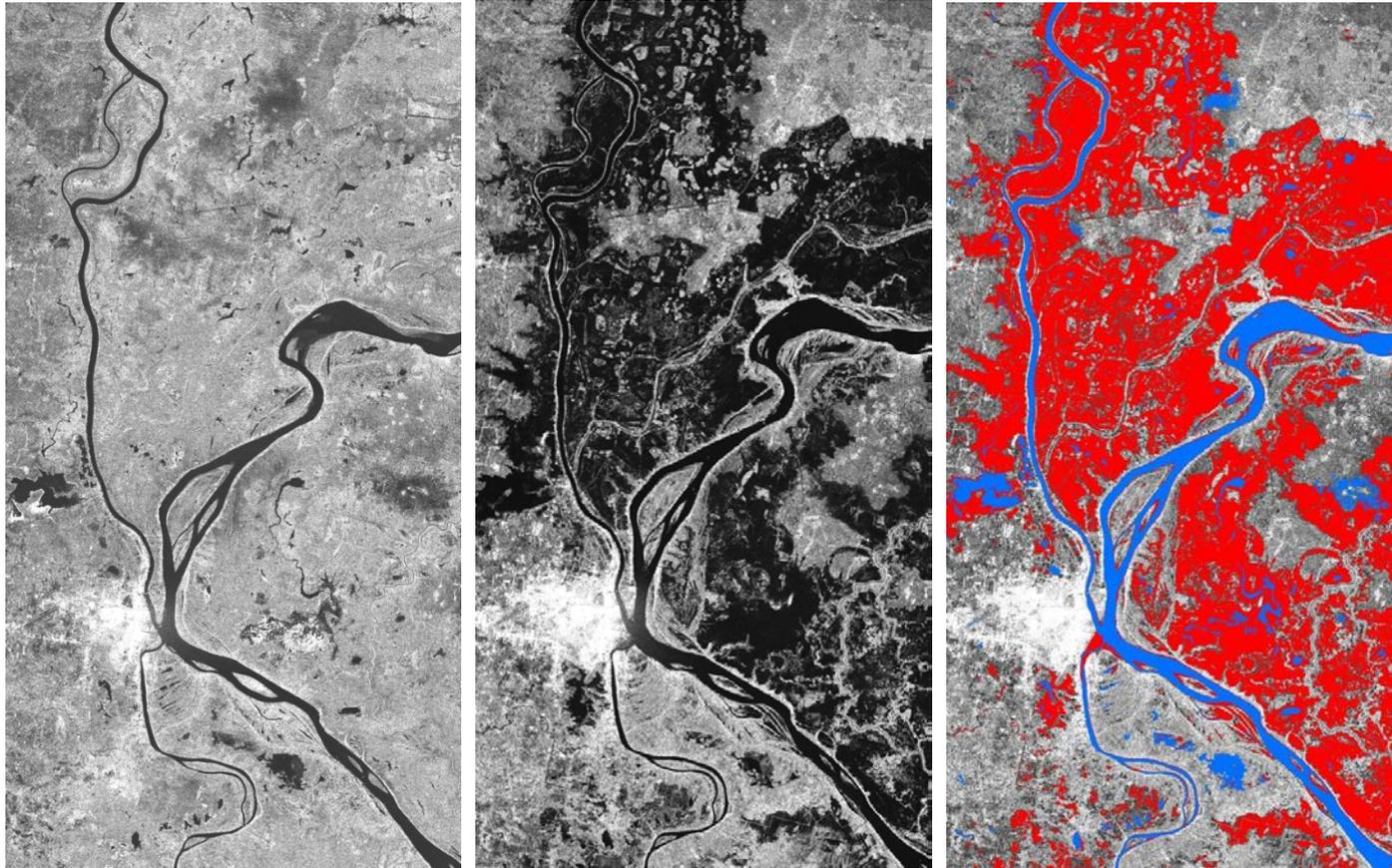


+41 75 411 4998



emergencymapping@unosat.org

Mekong River (Cambodia), 2008-floods



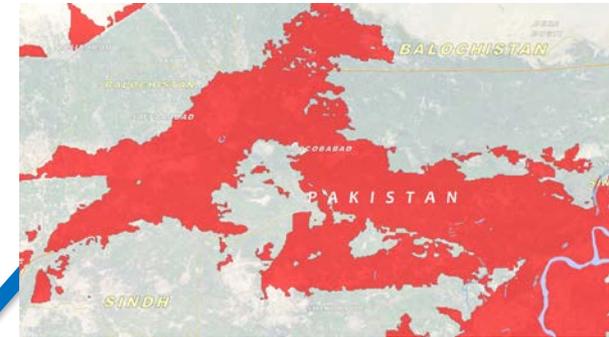
RADARSAT

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	BALOCHISTA N	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

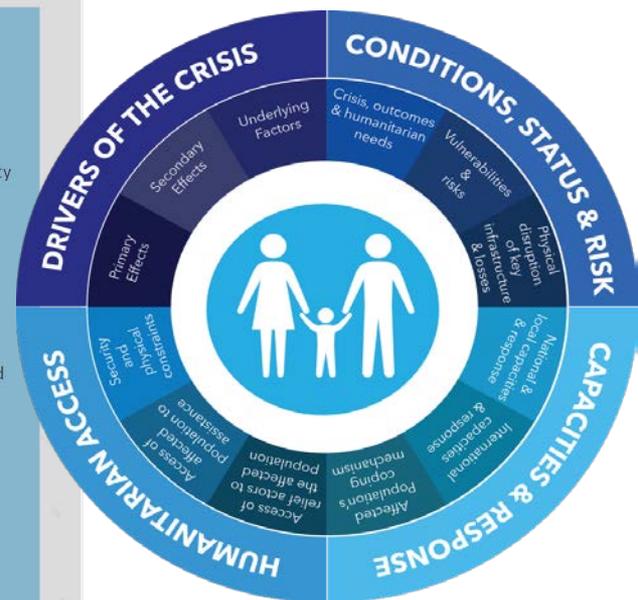
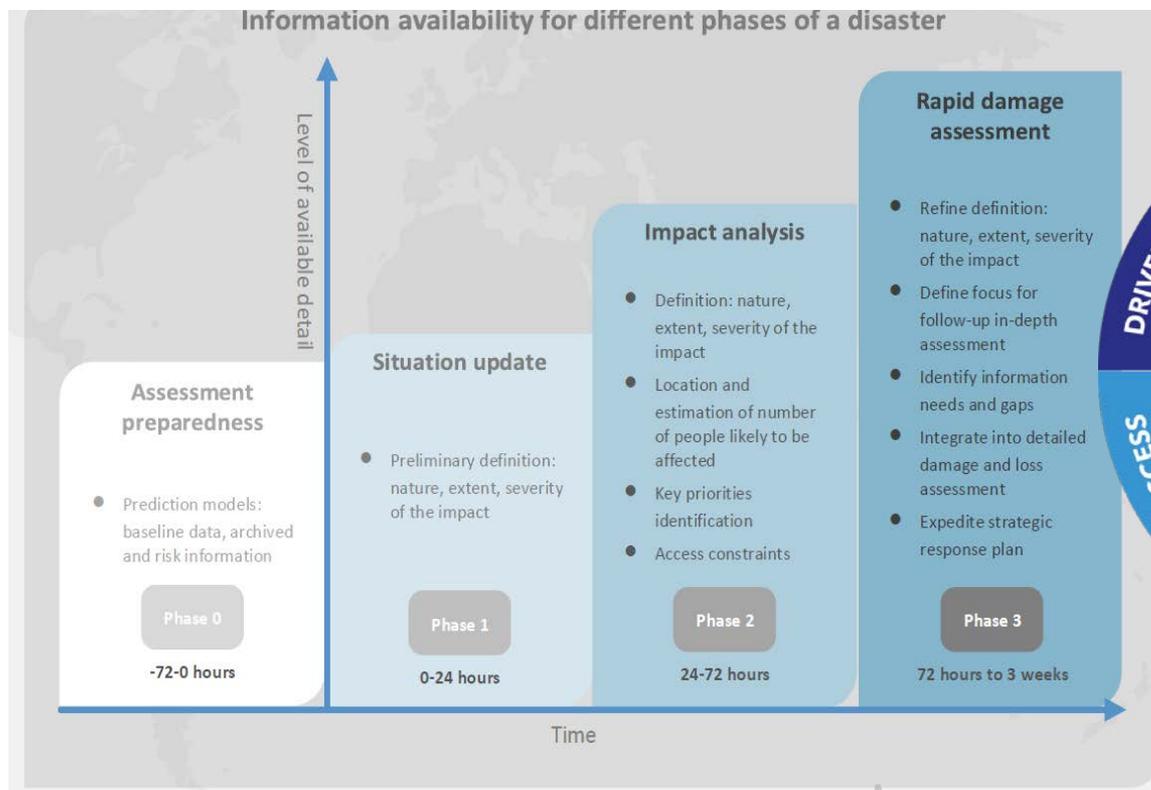
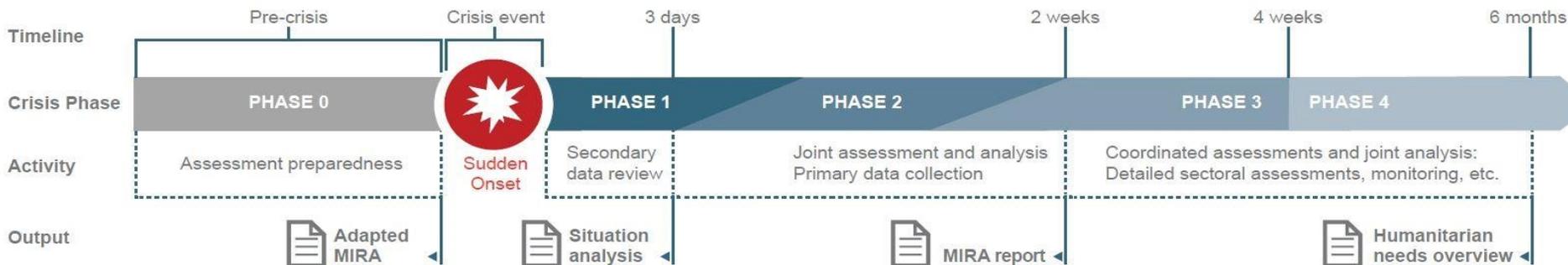


Before

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 	<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, extent, severity of the impact 	<ul style="list-style-type: none"> Definition, 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

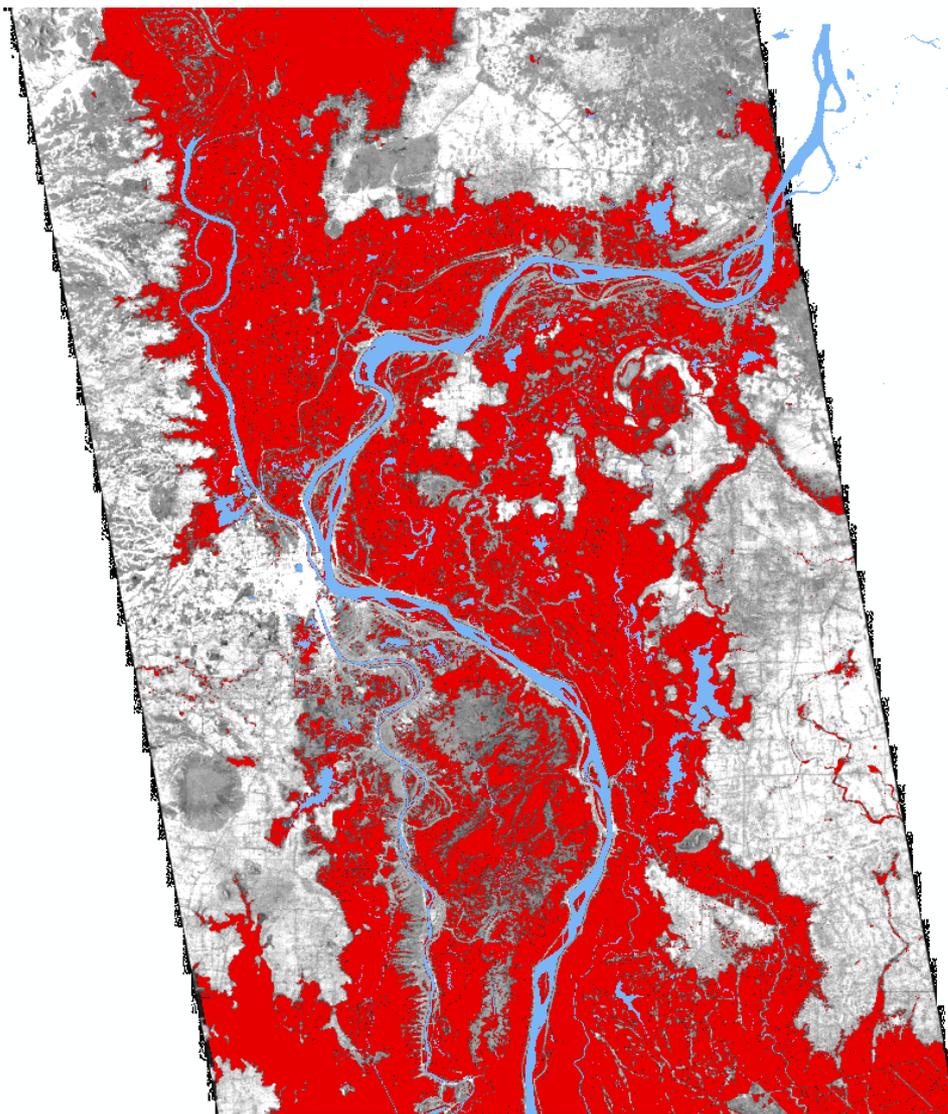
Land Slides

Refugees and
Internally Displaced
Persons Mapping

Cultural Heritage
Sites

Conflict Damage
Assessments

And so on..



Earthquake Damage Assessment

Floods

Earthquakes

Cyclones

Land Slides

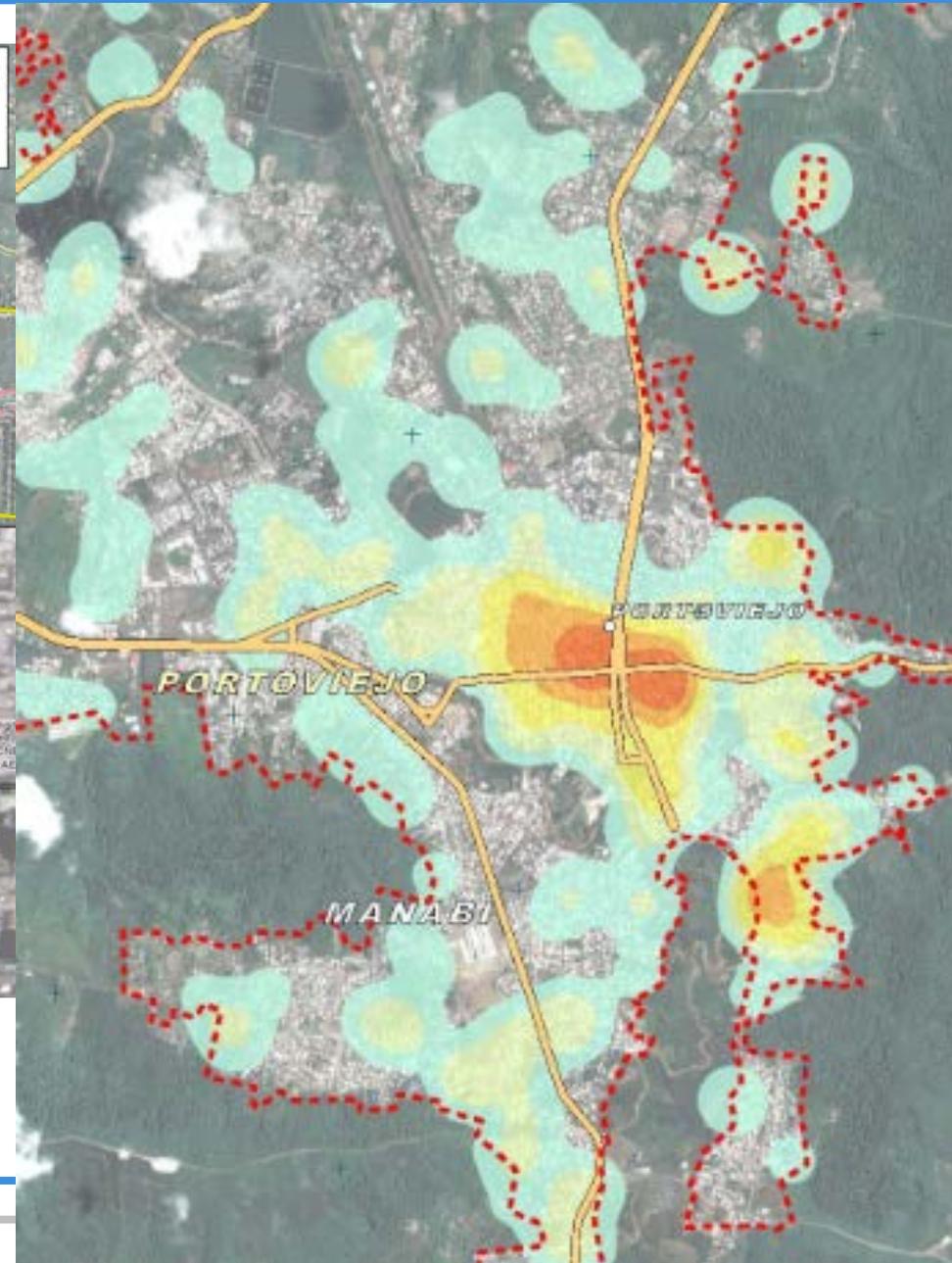
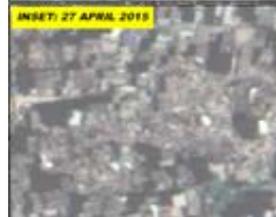
Refugees and Internally Displaced Persons Mapping

Cultural Heritage Sites

Conflict Damage Assessments

And so on..

Bhaktapur	
Damage Level	Count
Destroyed Structures	115
Severely Damaged Structures	170
Moderately Damaged Structures	173
Total Affected Structures	458



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

This map illustrates satellite-detected shelters and other buildings at the Domiz refugee camp in Duhok Governorate, Iraq. As of 25 December 2013 a total of 9,367 standard shelters were detected, 990 improvised structures likely being used for shelter and other purposes, and 592 infrastructure and support buildings. Domiz refugee camp is enclosed by a fence that surrounds the perimeter of the camp and delineates the ground for new construction as of 21 July 2013, as of 25 December 2013 contain a total of 564 new shelters (estimated). New expansion areas are also visible in the image as of 25 December 2013, indicating preparations are underway to accommodate increased numbers of refugees in the near future. This is a preliminary analysis and has not yet been validated in the field; structure locations subject to a spatial error margin of +/- three meters. Please send ground feedback to UNITAR/UNOSAT.



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: 30 cm
 Copyright: DigitalGlobe, Inc.
 Source: US Department of State, Humanitarian Information Unit, NorthView 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

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

Damage Assessment – Syria 2015

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

This map illustrates satellite-detected damage in a portion of the city of Aleppo, Syrian Arab Republic. Using satellite imagery acquired 01 May 2015, 26 April 2015, 23 May 2014, 23 September 2013, and 21 November 2010, UNITAR - UNOSAT identified a total of 5,170 affected structures within the extent of this map. Approximately 604 of these were destroyed, 2,641 severely damaged, and 1,625 moderately damaged. The city-wide analysis of Aleppo revealed a total of 14,034 affected structures, of which 2,878 were destroyed, 6,879 severely damaged, and 4,277 moderately damaged. While much of the city was damaged by 23 May 2014, 5,567 structures were newly damaged and 90 structures experienced an increase in damage between that date and 01 May 2015. This analysis was done of the REACH initiative for the U.S. Office of Foreign Disaster Assistance. This is a preliminary analysis and has not yet been validated in the field. Please send ground feedback to UNITAR - UNOSAT.



Production Date: 7/10/2015
Version 1.0
Activation Number: CE20130604SYR



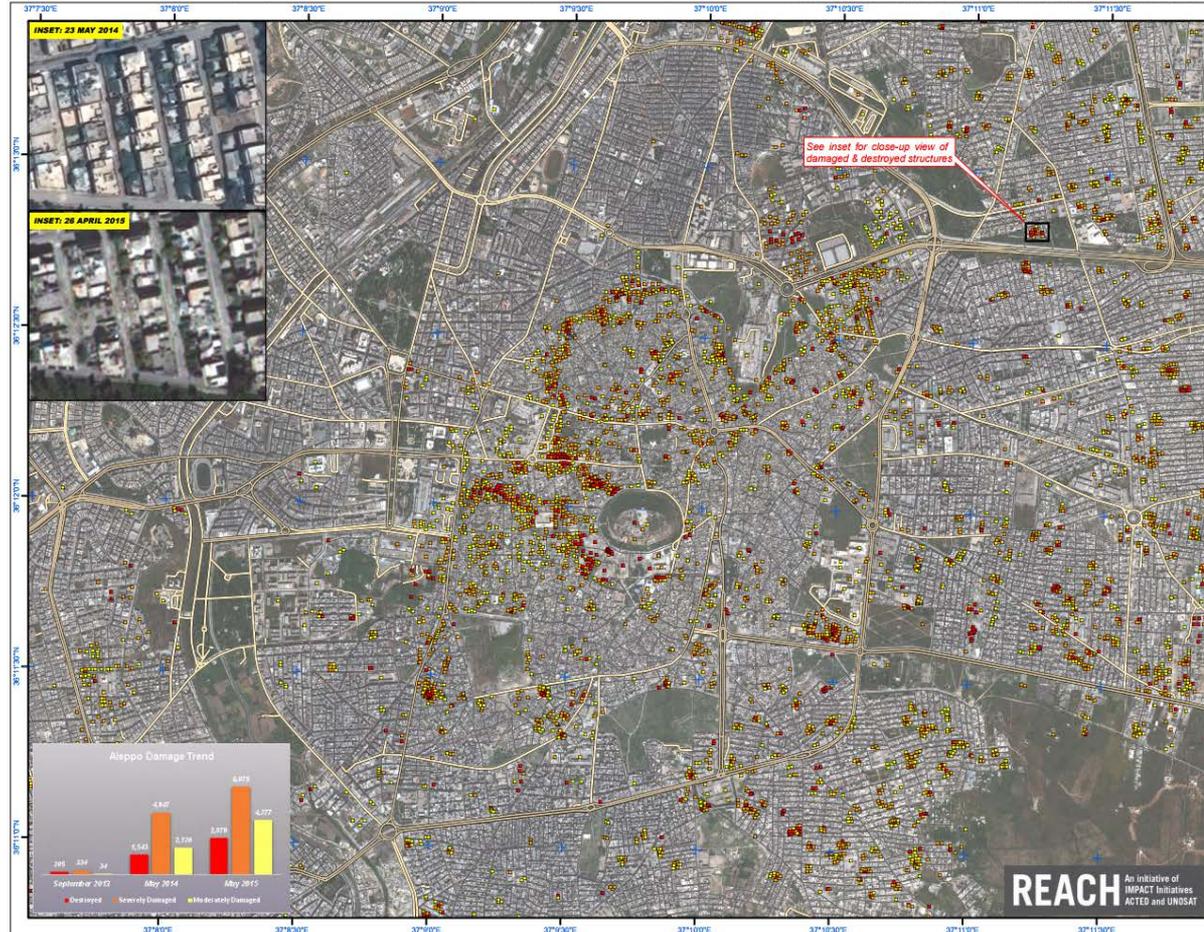
- LEGEND**
- Destroyed
 - Severely Damaged
 - Moderately Damaged
 - Highway / Primary Road
 - Secondary Road
 - Local / Urban Road



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, UNCS, 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.

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REACH An initiative of IMPACT Initiatives ACTED and UNOSAT

- Floods
- Earthquakes
- Storms/Cyclones
- Land Slides
- Refugees and Internally Displaced Persons Mapping
- Cultural Heritage Sites
- Conflict Damage Assessment



- 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

For Android Phones:	For iPhone:	For Windows Phones:
 UN-ASIGN 1.2 for Android by Ansufl <small>Support for off-line mode. Press-and-hold an image to upload. Delete previous version before install.</small>		
Android Market	iTunes Store	Windows Store

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



+ Add Widget

✓ Save

Khaled

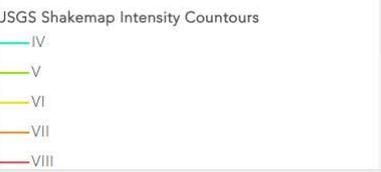


UNOSAT Operations Dashboard - Nepal Demo

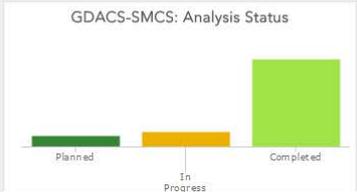
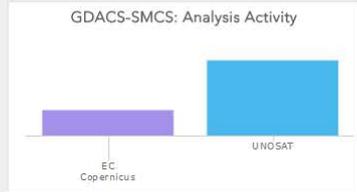
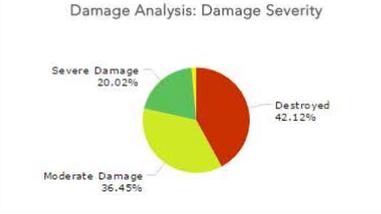
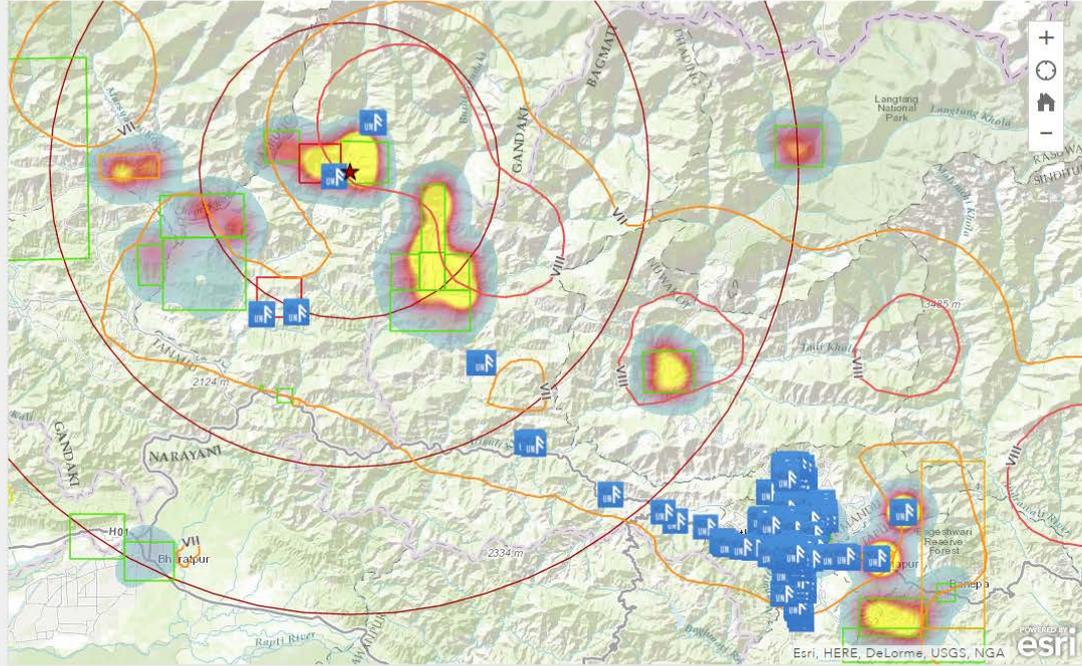
This Live Dashboard combines multiple analysis products from UNOSAT, Copernicus and other sources.

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 & has not yet been validated in the field. Please send ground feedback to UNITAR-UNOSAT. **Disclaimer:** data



UNOSAT Live Dashboard for Nepal Earthquake (demo)



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 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

22 Feb

24 Feb

09 March

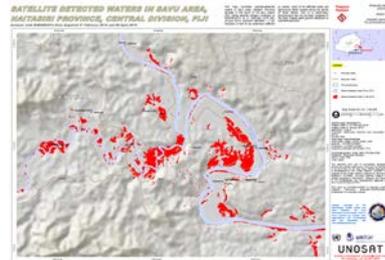
19 Feb

21 Feb

23 Feb

Situational Awareness Maps

Activation of International space charter



Assessment of standing waters.
Analysis done using radar data, extreme cloud cover

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



Received first suitable set of high-resolution imagery



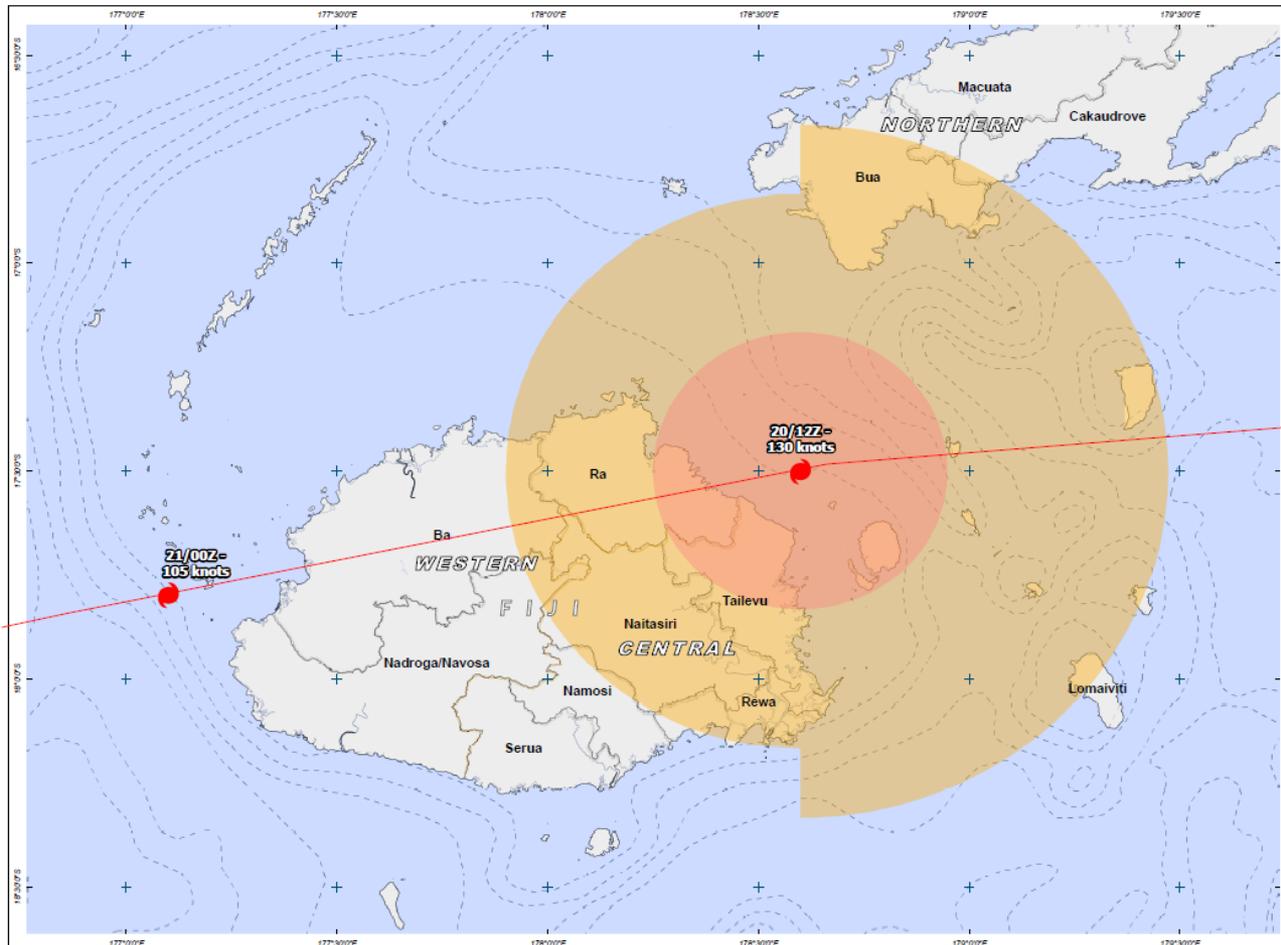
Situational awareness map: Forecasted track and probable population exposure

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 11F (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)
 -  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, UNCS, NASA, MGA,
 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.

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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.

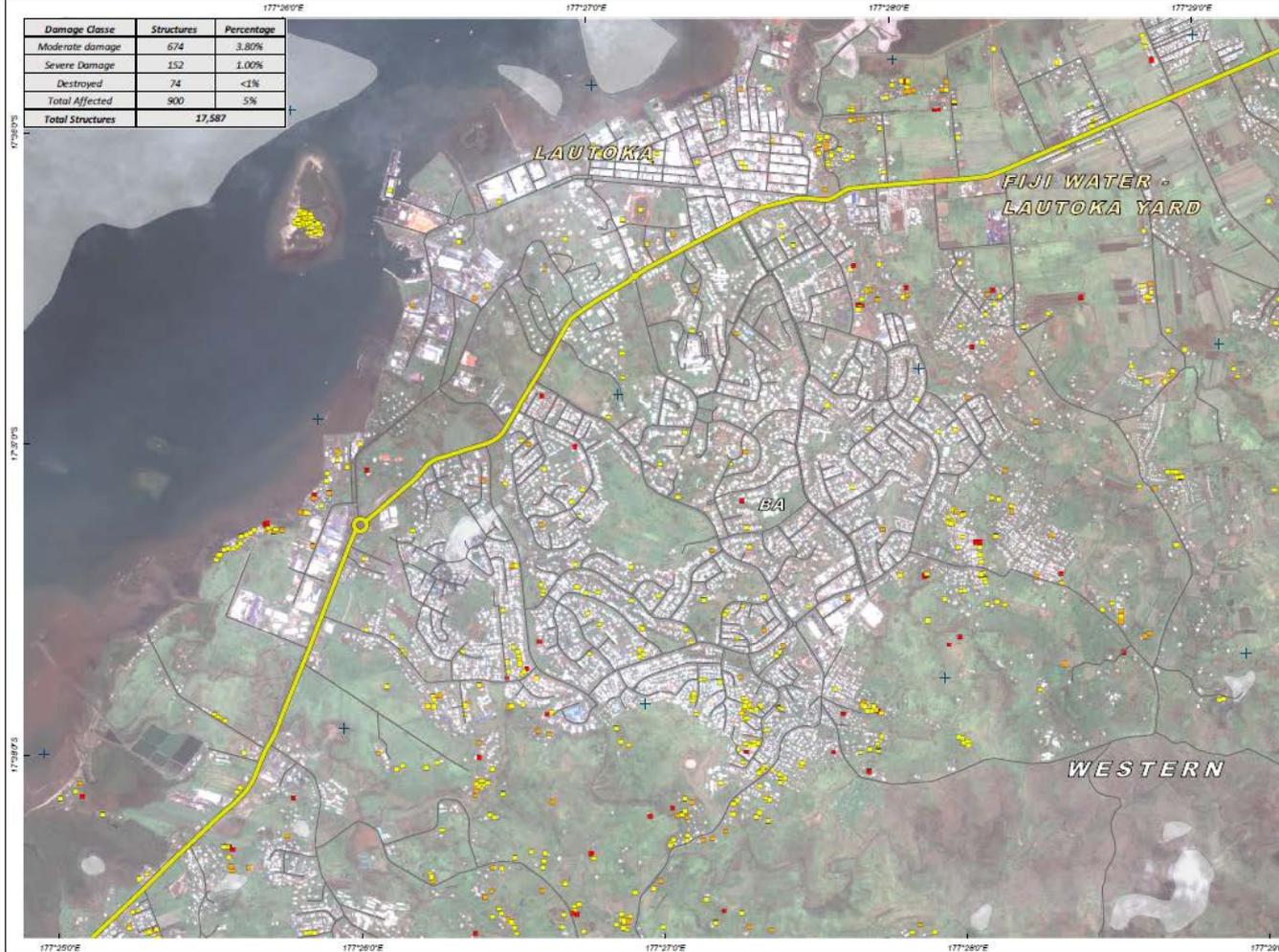
Tropical Cyclone



Production Date: 23/02/2016

Version 1.0

Glide: TC-2016-000014-FJI



LEGEND

- Destroyed
- Severe Damage
- Moderate Damage
- Primary Road
- Secondary/Local Road
- Cloud Obstruction

Map Scale for A3: 1:22,500

Satellite Data: Pleiades
 Imagery Date: 22 February 2016
 Resolution: 50 cm
 Copyright: CNES 2010) Distribution Airbus DS
 Source: AIRBUS DSS
 Road Data: OpenStreetMap
 Other Data: USGS, UNCS, NASA, NGA, SORAC
 Analysis: UNITAR-UNOSAT
 Production: UNITAR-UNOSAT
 Analysis conducted with ArcGIS v10.3

Coordinate System: WGS 1984 UTM Zone 00S
 Projection: Transverse Mercator
 Datum: WGS 1984
 Units: Meter

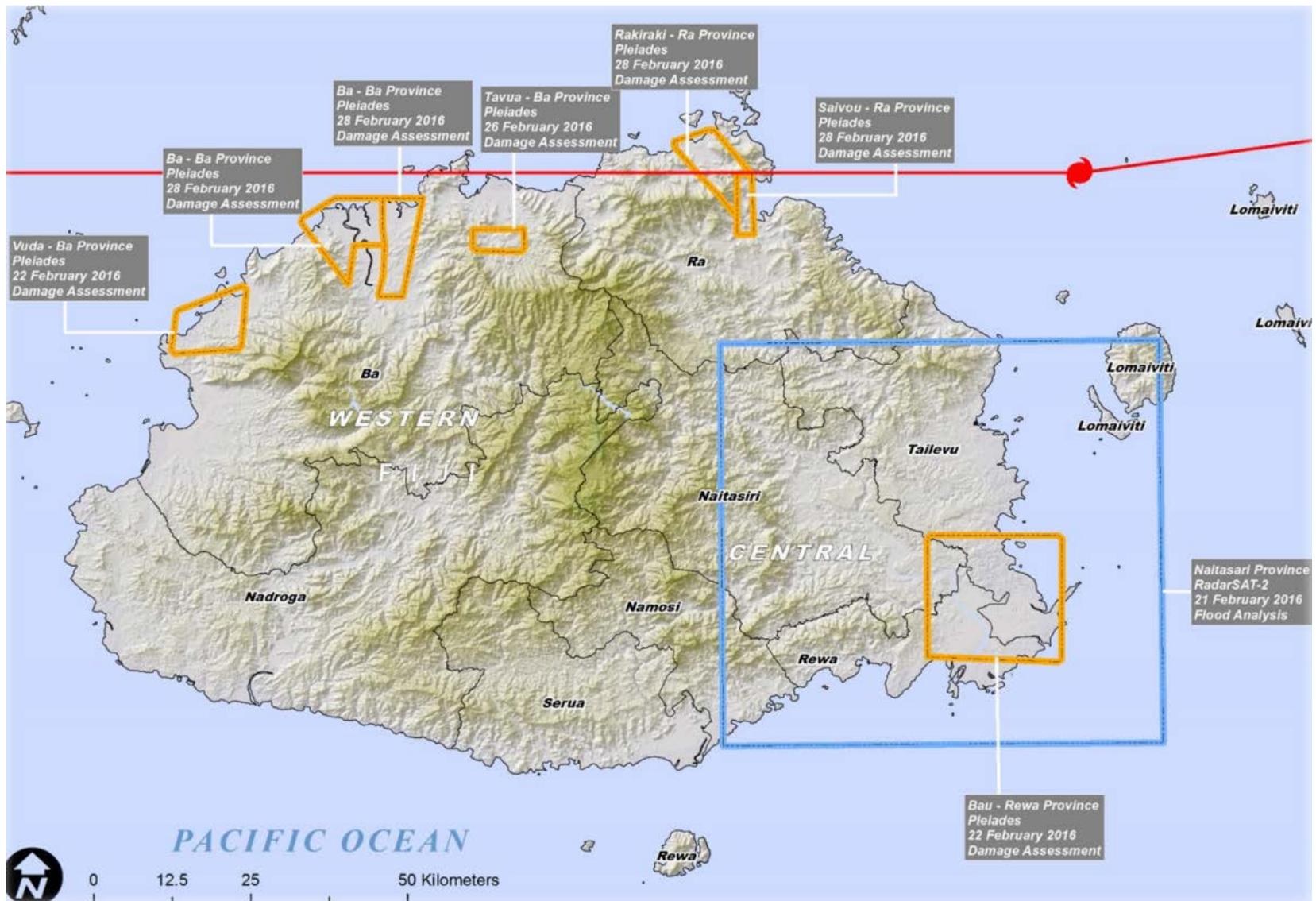
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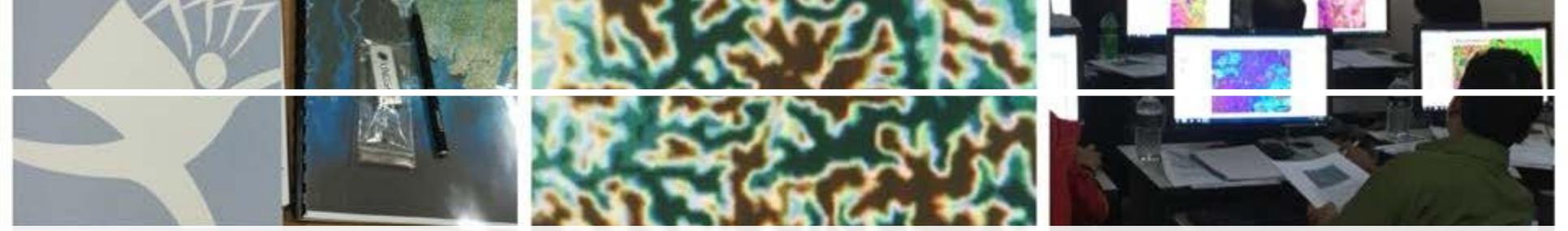
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Disaster coverage by the International Charter 'Space and Major Disasters'. For more information on the Charter, which is about assisting the disaster relief organizations with multi-satellite data and information, visit www.disasterscharter.org

UNOSAT

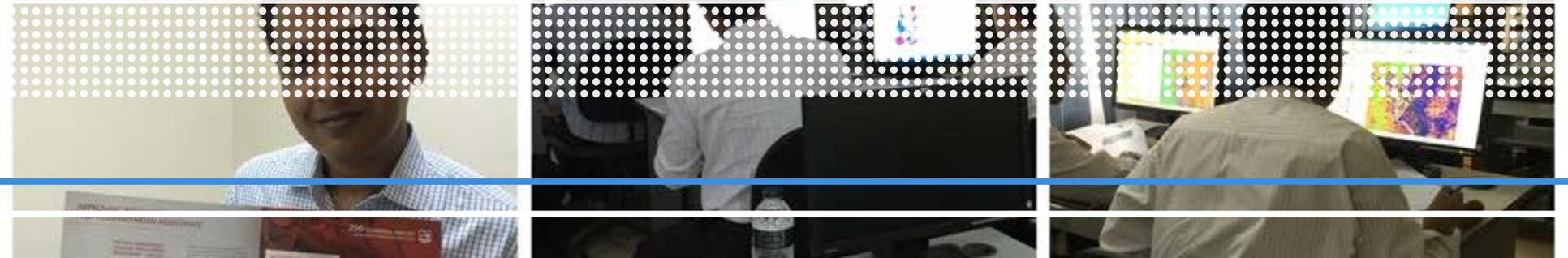
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Developing Tangible Capacities in Geospatial Information technology for Disaster Risk Reduction

Asia Capacity Development



Training & Capacity Development Activities

Master level courses

Basic and advanced courses

Capacity development programmes

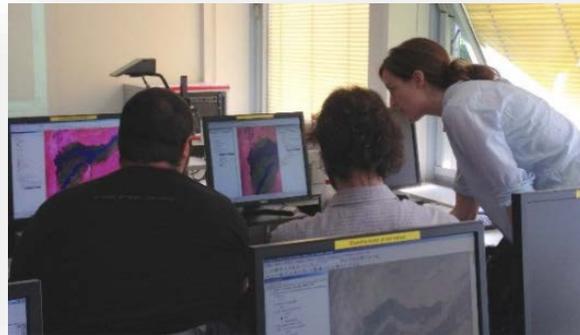
Workshops and information sharing

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



2 Weeks Long training course
GIT4DRR



Research by participants for
Appropriate project ideas



Project Selection & UNOSAT
technical support



Final Week of Training custom
tailored to support the project



Participant Project Works



Review of Analysis



Final Presentation

Promote Sustainability



Launch of Community of Practice
Forum



Participant to
participant professional
communication



Group online discussion



Participant Meet & Greet Once
in two Months

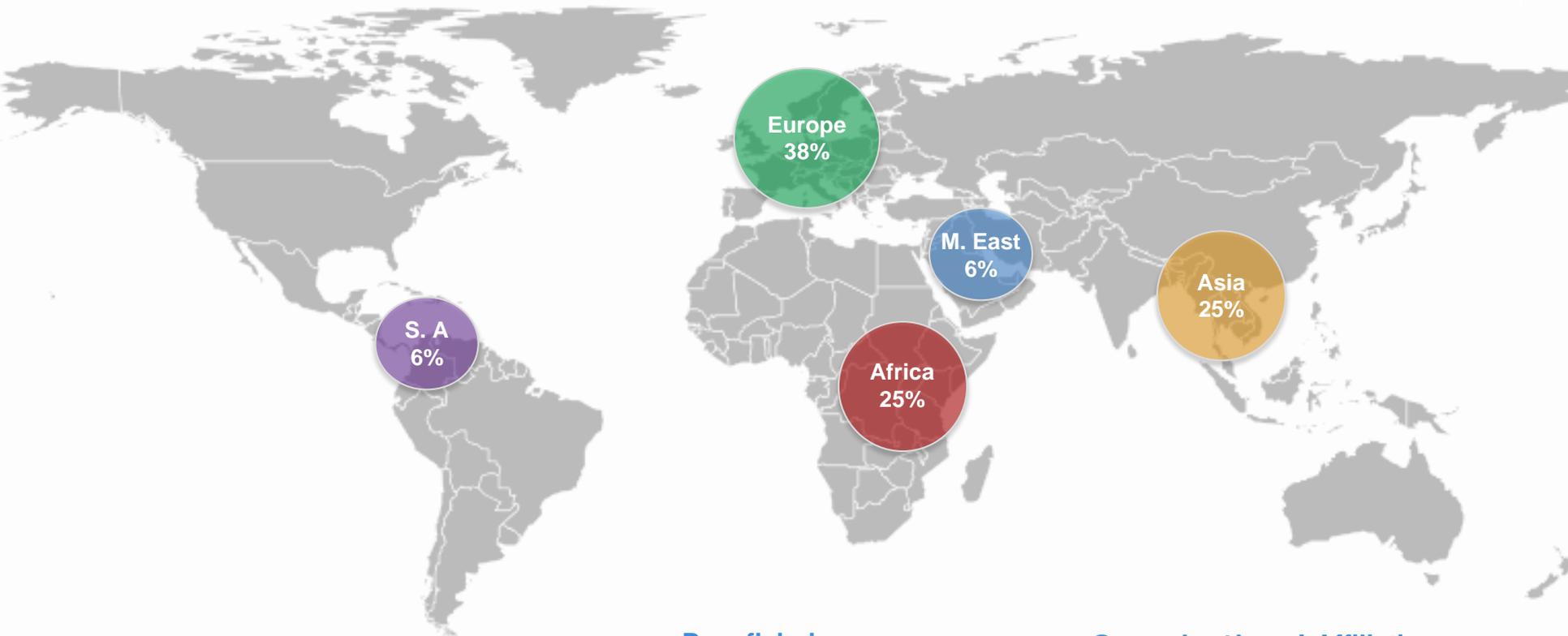
Maintain Capacity and Ensure Ownership



Select Community Champions &
Handover the group to community



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

854

28% 72%

Learning events

8000+

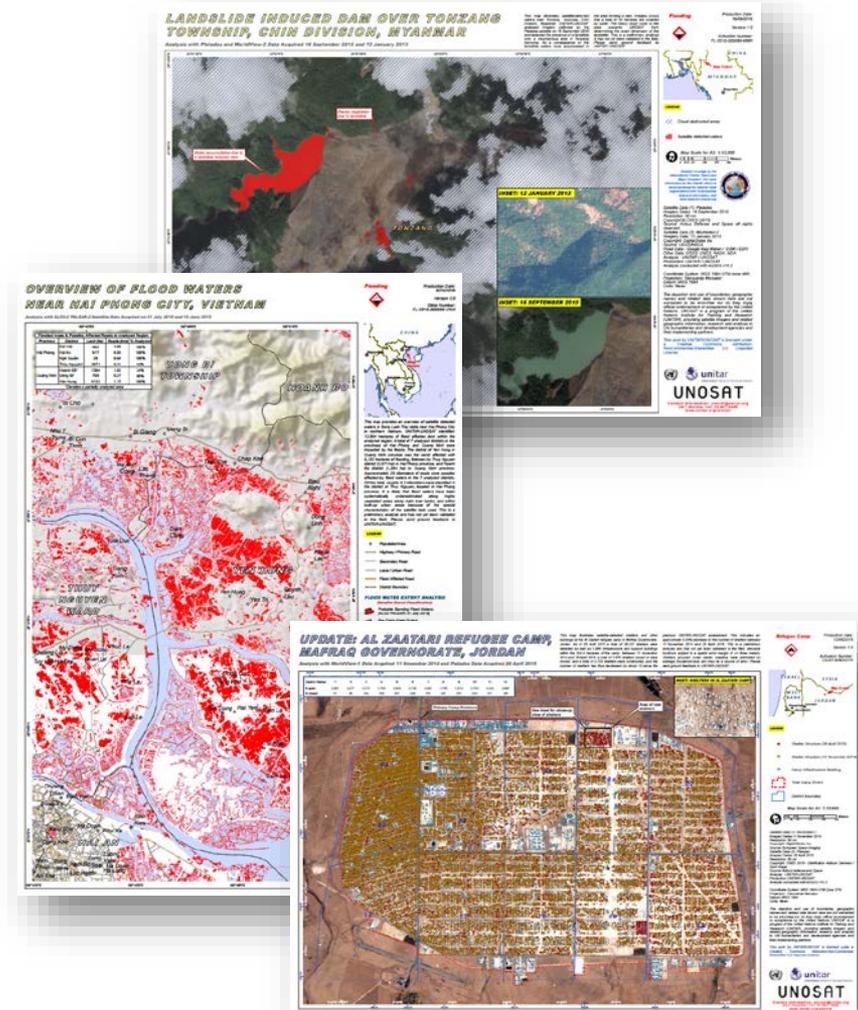
Knowledge sharing events

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???

