Contemporary Space Developments

Science and Tech

- The **number of objects** in space is **growing rapidly**
- Over **6,000 active satellites** with tens of thousands planned this decade
- **Mega-constellations** coming online
- **New tech** such as debris removal or extension services are **being developed**
- **Accessibility** to space is **increasing** but over 100 states lag behind
- **More stakeholders** than ever are capable of **developing and launching** space hardware

Economy

- Valued at over **$450 billion** – projections in 2040s at $1-$2.7 trillion
- **Commercial space activities** are quickly growing, representing around 80% of the overall value
- **Private companies** seeking to continue **expanding** to domains exclusively occupied by governments in the past
- Satellites contribute to more than **10% of GDP** in advanced economies
- Satellites are instrumental **for post Covid-19 recovery** and in the push to **greener economy**

Legal and Policy

- Space stakeholders and policymakers are working on addressing **novel issues** arising from **New Space**
- Growing need to enhance the **safety and security** of space operations, and the **long-term sustainability**
- Increased **international cooperation** on planetary defence and protection
- Enhanced **understanding and implementation** of international space law frameworks
- **SPACE 2030**

Space Objects
Overview of UN Registers

September 2022: 86% registered

Chart legend: Launched, Registered
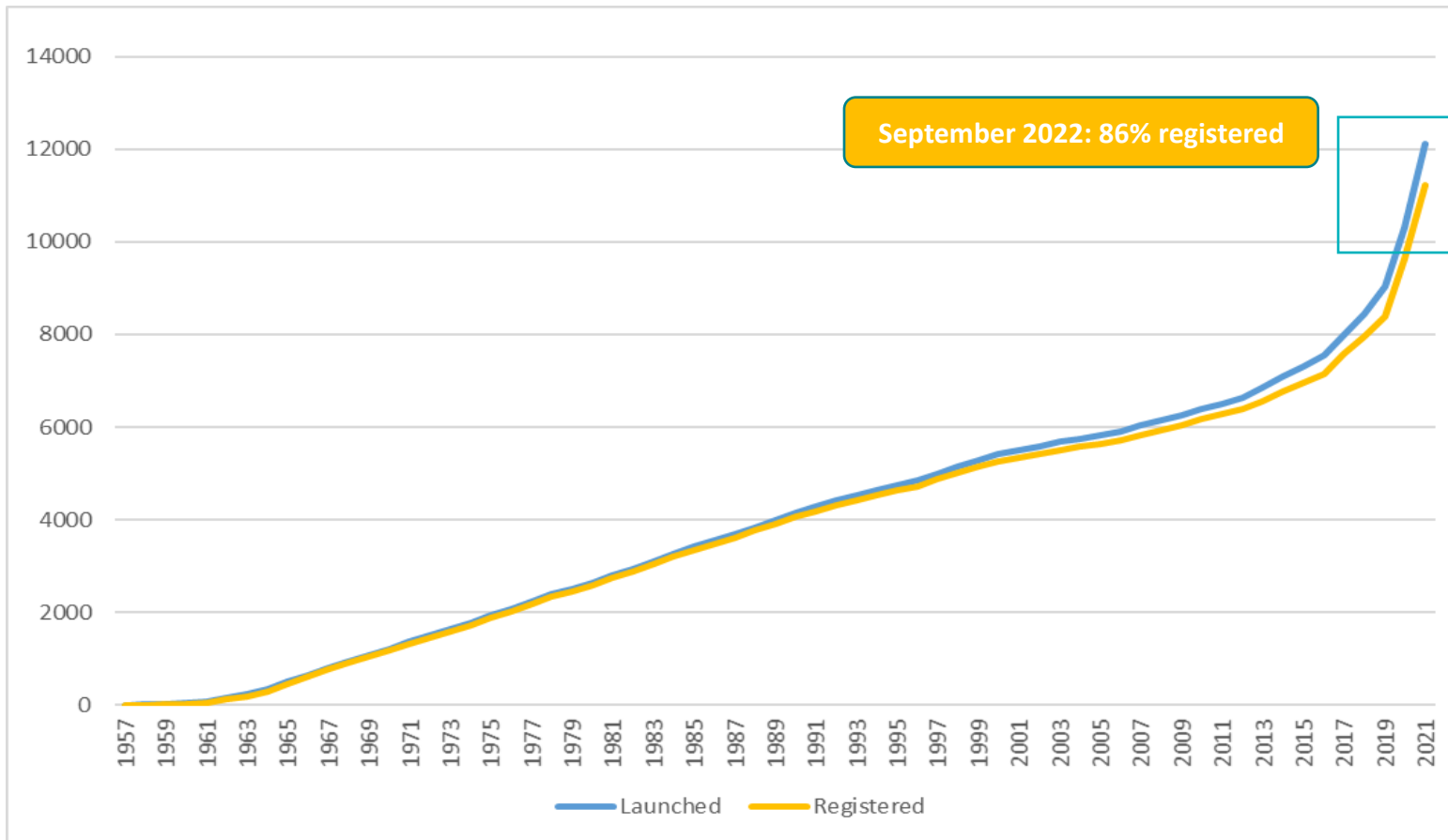
2018:
229 functional
101 non-functional
32 re-entry notifications

2021:
1895 functional
41 non-functional
172 re-entry notifications

September 2022:
1850 launched
1285 functional
31 non-functional
~ over 2,100 expected

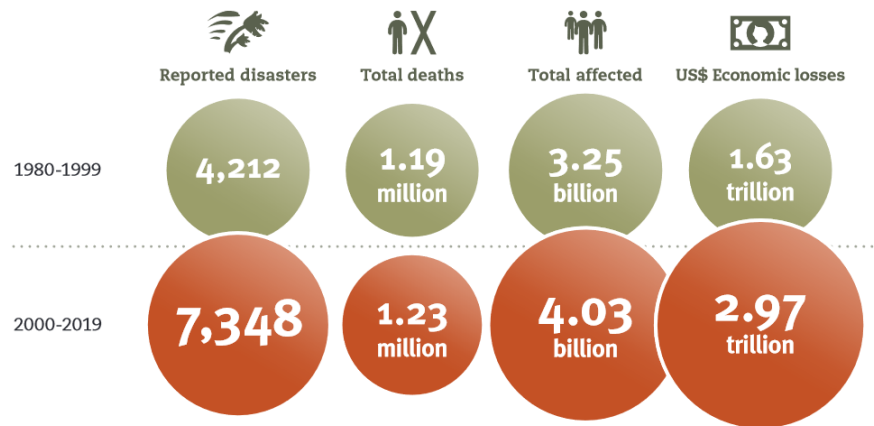**Projections (by 2032):**
100,000 objects

Key performance measure

Disaster Impacts: 1980-1999 vs. 2000-2019

	Reported disasters	Total deaths	Total affected	US$ Economic losses
1980-1999	4,212	1.19 million	3.25 billion	1.63 trillion
2000-2019	7,348	1.23 million	4.03 billion	2.97 trillion

Total disaster events by type: 1980-1999 vs. 2000-2019

	Drought	Earthquake	Extreme temperature	Flood	Landslide	Mass movement (dry)	Storm	Volcanic activity	Wildfire
1980–1999	263	445	130	1389	254	27	1457	84	163
2000–2019	338	552	432	3254	376	13	2043	102	238

Source: UNDRR 2020 report: *The human cost of disasters: an overview of the last 20 years (2000-2019)*
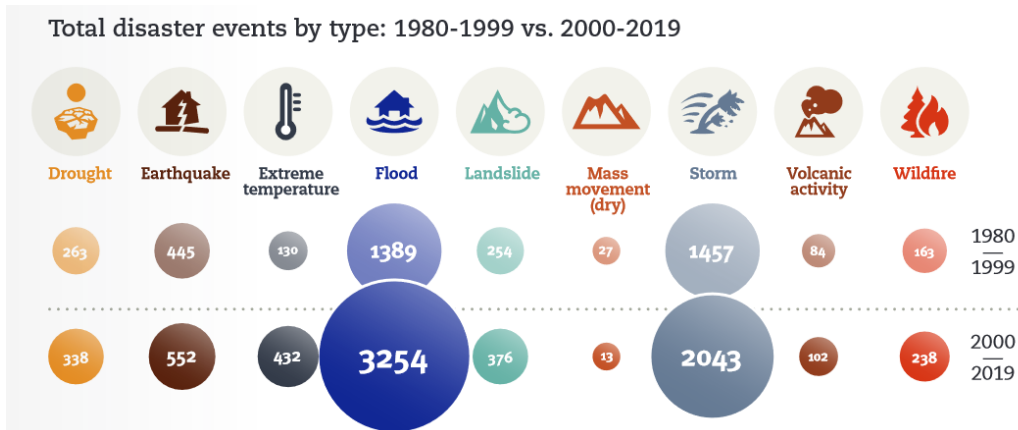
❑ Significant increase in
  ❑ Number of disasters
  ❑ people affected and
  ❑ economic losses

❑ Significant increase in climate related disasters
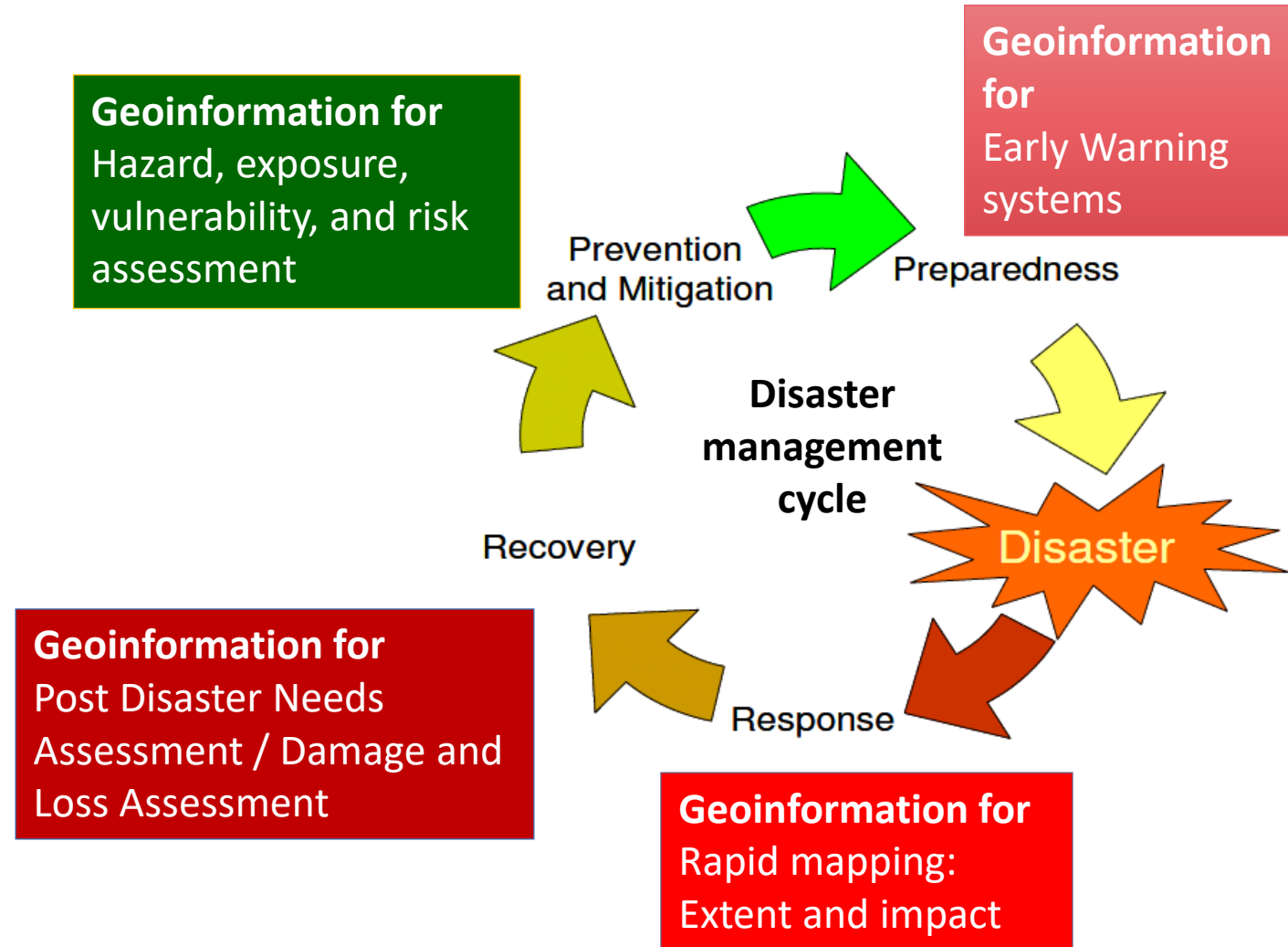 ❑ Floods
  ❑ Storms
  ❑ Wildfire

United Nations Platform for Space-based Information for Disaster Management and Emergency Response

Ensure that all countries have access to and develop the capacity to use all types of space-based information to support the full disaster management cycle

United Nations Resolution 61/110, Dec. 2006

Geoinformation for Hazard, exposure, vulnerability, and risk assessment

Geoinformation for Early Warning systems

Prevention and Mitigation

Preparedness

Disaster management cycle

Recovery

Disaster

Geoinformation for Post Disaster Needs Assessment / Damage and Loss Assessment

Response

Geoinformation for Rapid mapping: Extent and impact

UN-SPIDER facilitates the use of various space technologies to build disaster resilience

Earth observation

Satellite meteorology

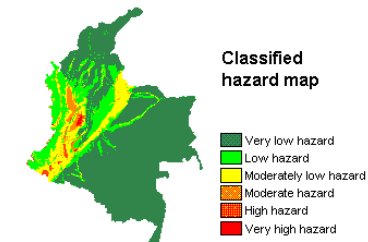**Global Navigation Satellite Systems (GNSS)**
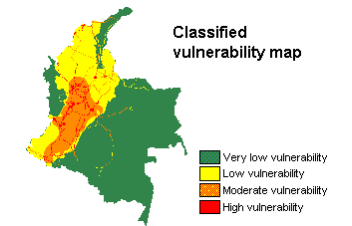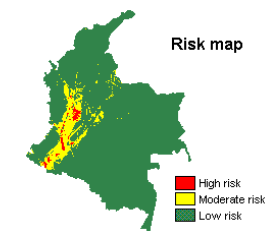
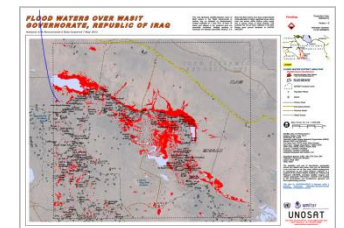**Satellite communication**

Global scale

Local scale

Life Saving Products

Classified hazard map
- Very low hazard
- Low hazard
- Moderately low hazard
- Moderate hazard
- High hazard
- Very high hazard

Hazard maps

Classified vulnerability map
- Very low vulnerability
- Low vulnerability
- Moderate vulnerability
- High vulnerability

Vulnerability maps

Risk map
- High risk
- Moderate risk
- Low risk

Risk maps

Response maps

UN-SPIDER@ Sendai Framework

UN-SPIDER contribution to the Sendai Framework for Disaster Risk Reduction 2015-2030

❑ **Contributed to consultation forums of Sendai Framework at regional and international levels**

❑ **Inclusion of the text in Sendai Framework: Earth observation and geospatial data as the evidence-based information**

❑ **Supporting the Member States in implementing Sendai Framework**

UN-SPIDER aligns with common goal of UN: Building Disaster and Climate Resilience

Sendai Framework
for Disaster Risk Reduction
2015 - 2030

Third United Nations World Conference on Disaster Risk Reduction
14 to 18 March 2015, Sendai, Japan

Assistance in building disaster resilience

❑ Policy-relevant advice during Technical Advisory Missions

❑ Incorporating space-based technologies in National DRR strategies

❑ Developing specific tools
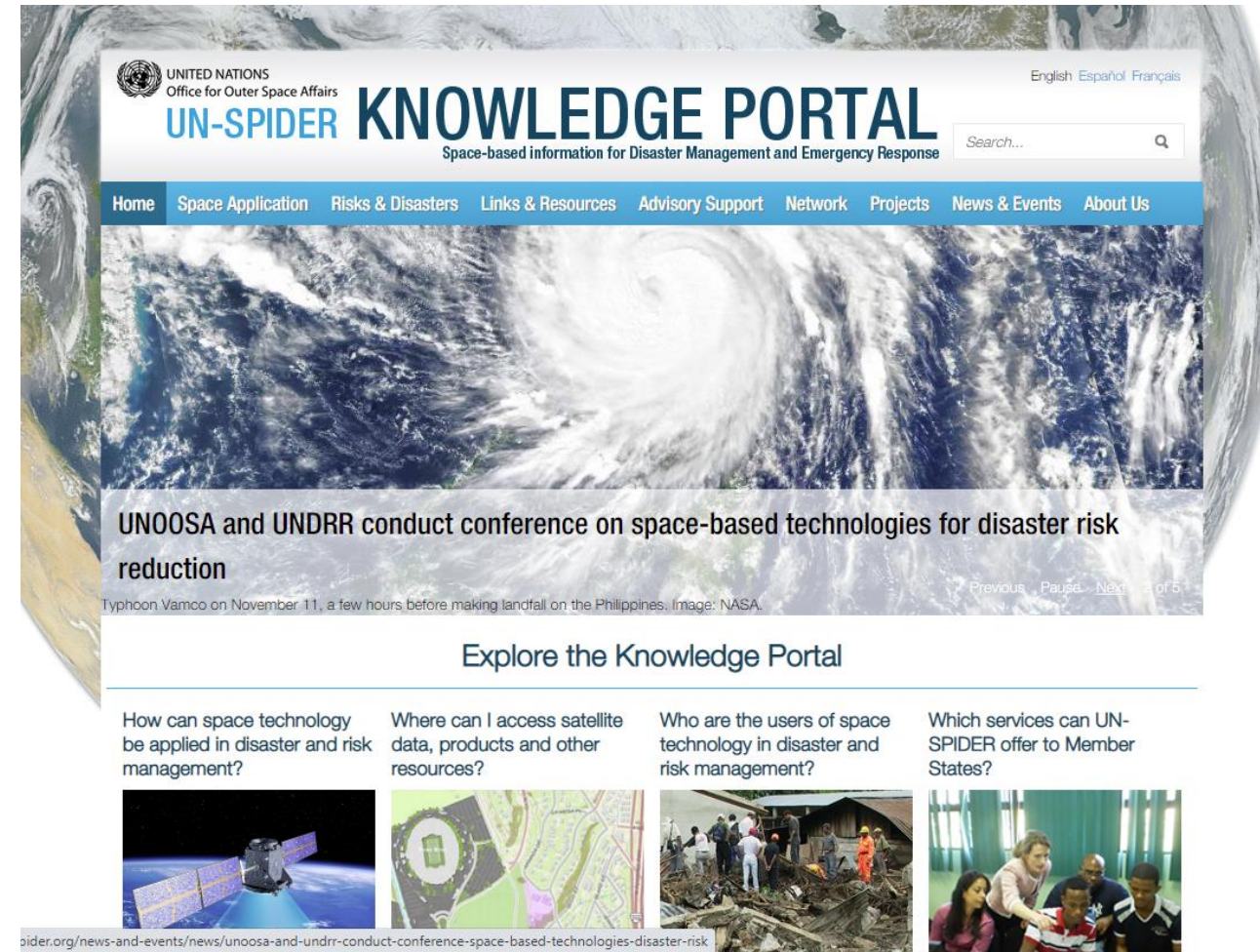
❑ Providing access to Earth observation data

Supporting emergency response

☐ Enabling National Disaster Management Agencies

☐ Facilitate access to pre and post event earth observation images

☐ Rapid response mapping

UN-SPIDER Knowledge Portal
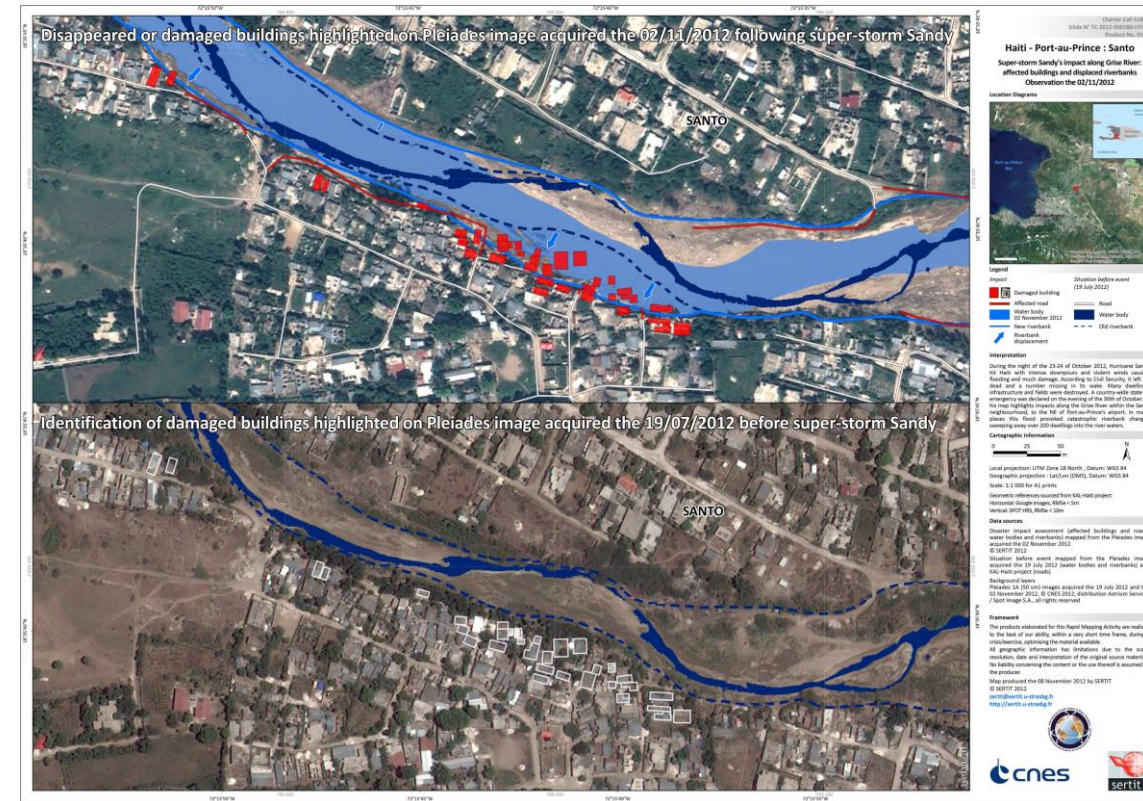
❑ Gateway to space-based information

❑ Available in English, Spanish and French

❑ More than 9,100 content items in 2020

❑ 45,000 visitors per month on average in the year 2020

❑ Step-by-step procedures to process satellite imagery

Capacity-building and institutional strengthening

❑ Training courses on the use of Earth observation in disaster management

❑ Procedural guidelines

❑ Recommended Practices

❑ Massive open online courses
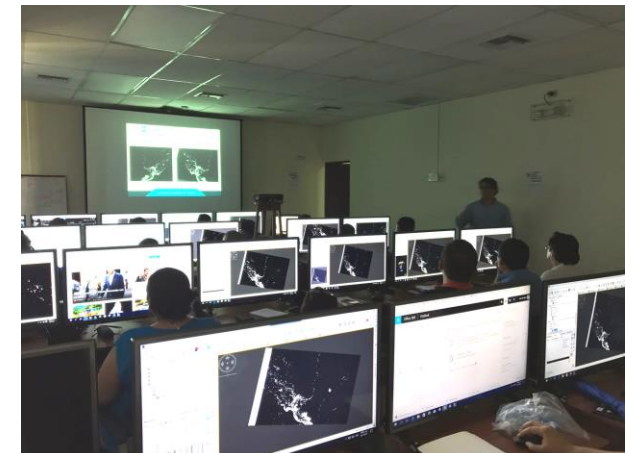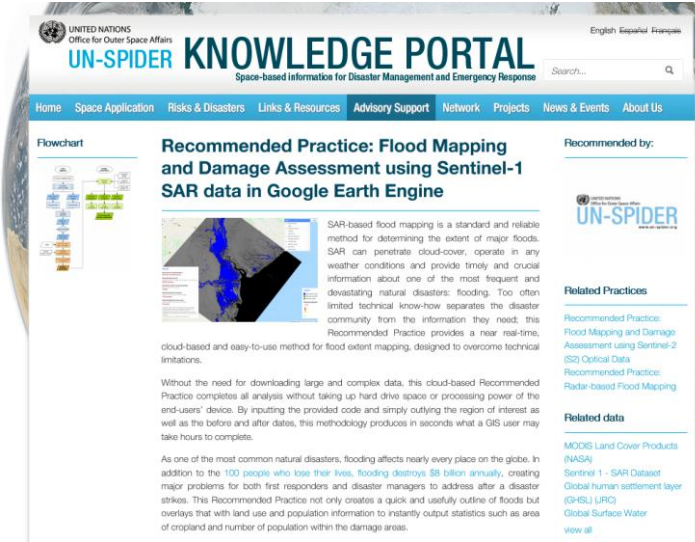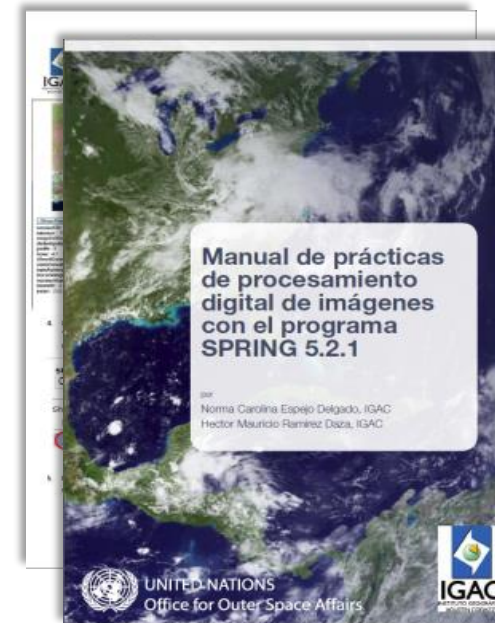
Increasing access to satellite imagery

- ❑ **Key OOSA and UN-SPIDER effort:**
  advocacy towards improved access to satellite-based data, both with national Space Agencies and with Private Sector

- ❑ **2010 - proposal for a Trust Fund within UN for satellite imagery in crisis and disaster management, not supported at that time**

- ❑ **Liaison with CEOS, GEO and dedicated working groups on disaster management support within those bodies, for ongoing coordination with Space Agencies**

- ❑ **Negotiations with private sector space-based imagery providers to increase free access to commercial data in case of disasters**
  - ❑ **Maxar Open Data Programme - https://www.maxar.com/open-data**
  - ❑ **Airbus Agreement**
  - ❑ **ICEYE agreement being discussed**
  - ❑ **Paz (Spain) agreement being prepared**
  - ❑ **BlackSky, Planet, SatelliteVU etc.**

- ❑ **Next generation satellite constellations will change the way of accessing and using satellite imagery! All users, UN system included, need to be prepared for this revolution**

UN-SPIDER Achievements 2007-2022

❑ Limited annual budgetary resources (regular and voluntary) – 850,000 US$ in average (75% staff costs)

❑ 101 missions (Technical Advisory Missions, Institutional Strengthening Missions, expert missions – on invitation by Governments)

❑ 55 countries supported

   ❑ 41 formal Technical Advisory Missions (TAM) with Gov't.-approved recommendations

❑ Over 1,500 experts in supported countries reached through training workshops and conferences, remote support etc.

❑ Network of 27 (+2) Regional Support Offices offering voluntary in-kind support

❑ Regular coordination with UN and external expert bodies

❑ Countries sponsored with data support, attendance at training workshops and relevant conferences

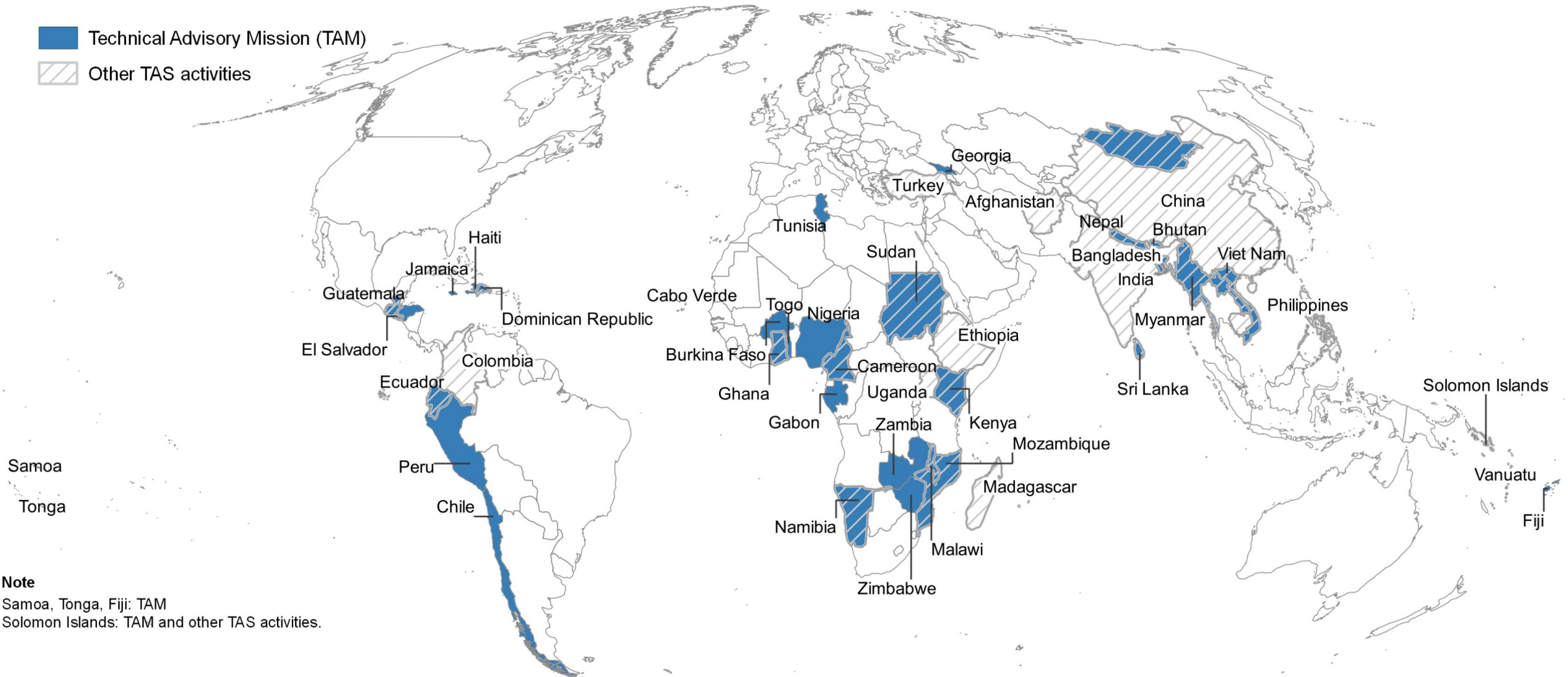❑ Emergency Response support with satellite data/mapping in over 30 countries

Countries that received SPIDER missions since 2007

Technical Advisory Mission (TAM)

Other TAS activities

Georgia
Turkey
Afghanistan
China
Tunisia
Nepal
Bhutan
Bangladesh
Viet Nam
Sudan
India
Haiti
Jamaica
Cabo Verde
Togo
Guatemala
Nigeria
Philippines
Dominican Republic
Myanmar
El Salvador
Burkina Faso
Ethiopia
Colombia
Cameroon
Sri Lanka
Ecuador
Ghana
Uganda
Gabon
Zambia
Kenya
Solomon Islands
Peru
Mozambique
Madagascar
Samoa
Vanuatu
Tonga
Chile
Namibia
Malawi
Fiji
Zimbabwe

Note
Samoa, Tonga, Fiji: TAM
Solomon Islands: TAM and other TAS activities.

(voluntary) Regional Support Offices to UN-SPIDER

RSO Norway
RSO UCL*
RSO Ukraine
RSO Kazakhstan
RSO Germany
RSO Romania
RSO Delta State U.
RSO Greece
RSO I.R. Iran
RSO Mexico
RSO Algeria
RSO UWI
RSO Pakistan
RSO ICIMOD
RSO Thailand
RSO CATHALAC
RSO Nigeria
RSO Colombia
RSO IWMI
RSO RCMRD
RSO Indonesia
RSO Argentina
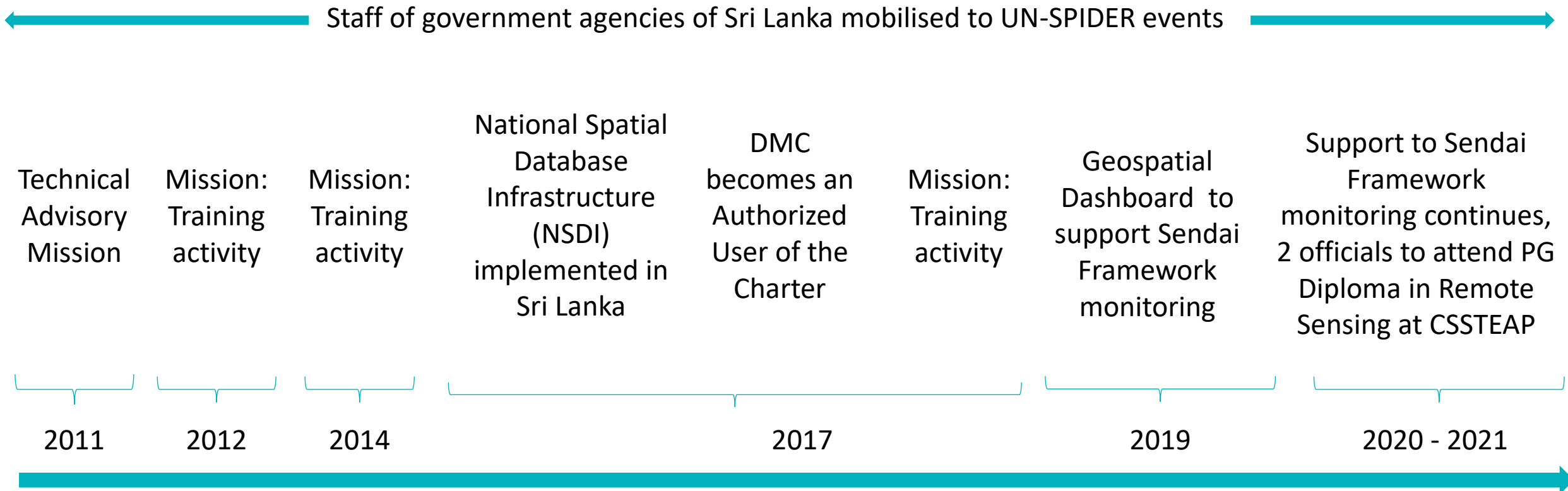
www.un-spider.org

18 January 2023

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SPACE4SDGS

Sri Lanka: National Spatial Data Infrastructure (NSDI), Sendai Framework monitoring tool and support during emergencies

← Staff of government agencies of Sri Lanka mobilised to UN-SPIDER events →

Technical Advisory Mission	Mission: Training activity	Mission: Training activity	National Spatial Database Infrastructure (NSDI) implemented in Sri Lanka	DMC becomes an Authorized User of the Charter	Mission: Training activity	Geospatial Dashboard to support Sendai Framework monitoring	Support to Sendai Framework monitoring continues, 2 officials to attend PG Diploma in Remote Sensing at CSSTEAP
2011	2012	2014		2017		2019	2020 - 2021

To assist Armenia in improving **Disaster Risk Management & Emergency Response** by effective utilization of the **space-based technologies and Geospatial Information**, thereby helping to achieve **Sustainable Development Goals (SDGs)**

Programme

ARMEN PAMBUKHCHYAN

Engagement at the Ministerial level

Meetings with the
Ministry of Emergency Situations
Ministry of Economy
United Nations in Armenia
Cadastre Committee
Ministry of Foreign Affairs
Ministry of Education, Science, Culture and Sports
Ministry of High Technological Industry
Space Museum
Ministry of Health
Ministry of Labor and Social Affairs
Ministry of Territorial Administration and Infrastructures
RA Police

Workshop
Briefing to the Key Stakeholders

What we observed

- Current strategies and policy framework related to DRR, Space and Geospatial Information
- Availability of Geospatial Information
- Current use of Space-based Technologies
- Institutional linkages and coordination
- Data Sharing practices
- Applications of Geospatial Information
- Existing capacity and needs
- Challenges and constraints
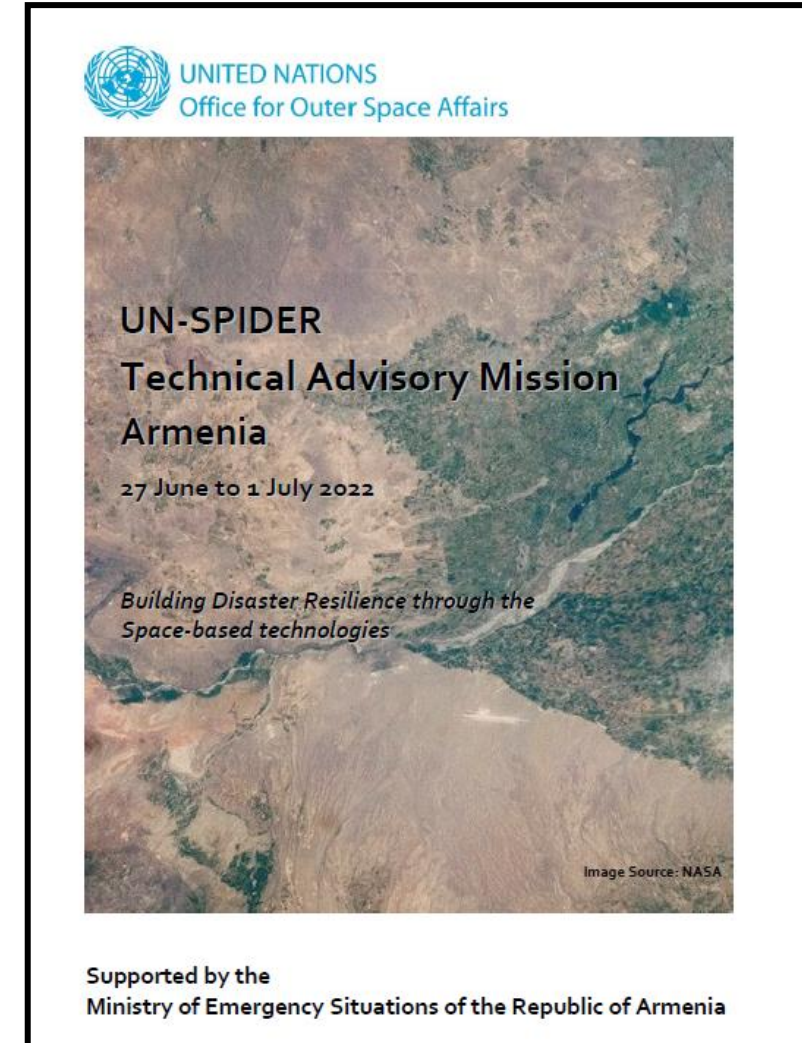
Long-term engagement of UN-SPIDER with Armenia

- Support to implement the **Sendai Framework**

- Assist on strengthening **Disaster Risk Management frameworks** and formulating strategies at national/local level

- Understand, Identify and **map the disaster risks**

- Timely assistance during **emergency**

- Assist in **capacity building** of the Key Stakeholder Organisations

- Partner with the **UN Country Team** in and other agencies in Armenia

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SPACE4SDGS

❑ Capacity to deliver on all requests

❑ Ability to provide continuous support to each country visited as needed

❑ Liaison offices or staff presence in regional (UN) hubs

❑ Engaging Member States to keep pace with fast changing space technologies

❑ Provide targeted, prioritized support to countries, on demand

❑ Increase number of LMI Countries assisted

❑ Increase support to Africa and the Pacific SIDS, Central Asia

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SPACE4SDGS

Thank you

czaran@un.org

18 January 2023