

1. Executive Summary

Full title: Earth Observation and Copernicus in support of Sendai Monitoring

Acronym: “EO4Sendai”

Proposed category: Community Activity

Overview:

The United Nations included seven global targets in the *Sendai Framework for Disaster Risk Reduction 2015–2030* (SFDRR) and agreed on 38 indicators to measure the global progress in implementing the SFDRR. Monitoring the status and degree of target achievement globally requires the use of various data sources (e.g. official data, media reports, insurance data, satellite earth observation data), which should be consistent and comparable in time and space. In the majority of states, however, the 38 Sendai indicators are currently not recorded in the way they should be reported to UNISDR and data gaps pose a challenge to the reporting mechanism. Against this background, EO4Sendai aims at exploring how Earth Observation (EO), such as the European Earth Observation Programme Copernicus, can support the implementation of the SFDRR and specifically develop guidelines and good practices about using EO for deriving selected Sendai indicators. Through this activity, the use of EO can be maximized to support national Sendai Focal Points in the Sendai reporting. The activity will be initially implemented in Germany to inform the German Sendai Focal Point, but the activities results shall be made usable for focal points in other countries through knowledge transfer by international and development cooperation organisations.

Planned activities:

- Assessing the feasibility of EO and derived products to derive information for Sendai indicators including a comprehensive report with results from the feasibility study;
- Developing guidelines, good practice guidance, and trainings about using EO and derived products for deriving selected Sendai indicators;
- Sharing examples how to include EO data in national Sendai monitoring processes.

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2. Purpose

At the Third World Conference on Disaster Risk Reduction in Sendai, Japan, in 2015, the United Nations adopted the “Sendai Framework for Disaster Risk Reduction (2015 – 2030)” (SFDRR). To measure global progress in implementing the Sendai Framework, seven global targets and 38 quantifiable indicators, including various sub-indicators, have been agreed on by the international community.

In the majority of states, however, the 38 Sendai indicators are currently not recorded in the way they should be reported to UNISDR. Monitoring the status and the degree of target achievement uniformly requires the use of various data sources, which should be consistent and comparable in time and space. Therefore, different potential data sources (e.g. official data, media reports, insurance data etc.) can be considered for the Sendai monitoring, if existent. However, these data sources do in any case cover all requirements, for example (i) datasets are not always available retroactively to the year 2005 (baseline), (ii) damage information might only available for individual hazard types (e.g. floods), (iii) data was not collected uniformly or only for individual sectors. The data readiness review¹ indicated that only 60% of reporting countries do actually have a database for disaster losses, and only 41% of the participating countries report to have data records for the entire baseline period. Besides, the availability of data varies among the different Sendai targets. The resulting data gaps could be closed by new technologies and in particular by satellite remote sensing and the European Copernicus Earth Observation Programme.

The Copernicus Programme establishes a modern and efficient EO infrastructure, aiming to help understanding our planet and sustainably managing the environment. To this end, Copernicus provides various value-adding information products through satellite and in-situ data, as well through the Copernicus thematic services. The Copernicus Emergency Management Service (CEMS) provides remote-sensing based products and corresponding evaluations in all phases of the crisis management cycle. In the aftermath of a disaster, satellite images of the affected areas can identify the spatial extent of an event and identify the degree of destruction. Such information is of potential value to support the reporting of Sendai indicators. However, such progress must be incorporated into the official procedures of the reporting agencies. In order to foster the uptake of this technology, the planned activity will explore how Earth observation can be used to support the Sendai indicator monitoring. It will investigate the potentials of satellite remote sensing and specifically Copernicus for deriving selected Sendai indicators (or components of it) and provide good practices guidelines. The activity initially will be implemented in Ger-

¹ UNISDR 2017: Disaster-related Data for Sustainable Development – Sendai Framework Data Readiness Review 2017. Global Summary Report. https://www.unisdr.org/files/53080_entrybgpaperglobalsummaryreportdisa.pdf (last accessed 18.02.2019)

many, where the focal points for both, the CEMS and the Sendai Framework are situated at the German Federal Office for Civil Protection and Disaster Assistance (BBK).

This activity plans to identify opportunities and show practical implementation for EO to be used by national governments for the Sendai indicator reporting. It is intended that the outputs of the project enable national focal points for the Sendai Framework to provide better and more consistent methods and – where possible – valued added products from remote sensing to support the Sendai monitoring process. Moreover, EO4Sendai intends to improve and validate existing procedures and develop new methods based on satellite remote sensing and the Copernicus Programme in order to derive data and services for the Sendai monitoring. For this purpose, one or more demonstrators will be developed for complete or partial derivation for selected indicators and for the implementation in the processes at the BBK.

Although the activity will be initially implemented in Germany to inform the German Sendai Focal Point, developed methods and guidelines shall be made useable for organisations in other countries. Activity outcomes can support the implementation of the SFDRR and the monitoring of its targets in developing and emerging economies through knowledge transfer by development agencies and international organisations. It is expected that the activity's results will support the monitoring processes in other countries, e.g. by closing gaps in the data base, and will directly add to Sendai priority 1 “understanding of disaster risk”, increase preparedness for disaster response and recovery and thus strengthen a countries' resilience towards disaster risks.

3. Key Activities

In support of the monitoring for the SFDRR, the community activity plans to (i) undertake a comprehensive feasibility study about the usefulness, usability and accuracy of EO data for monitoring Sendai indicators, and (ii) conceptualizing new or improved methods and procedures for the derivation of selected Sendai indicators with satellite EO and Copernicus data and services. The knowledge gained should ultimately serve as the basis for supporting operational monitoring of Sendai targets.

Governmental institutions and Sendai national focal points in developing and emerging economies will be supported via knowledge transfer in improving the data base for their own monitoring through the sharing of the projects methodologies and outcomes. International organizations and development cooperation agencies will be invited to share the expertise developed. To this end, it is planned to create good-practice guidelines and fact-sheets and to share these via the CEMS National Focal Point at the BBK as well as via other interested organizations or focal points. Integrating development cooperation and international organizations (such as GIZ,

UN–SPIDER) is envisaged to contribute to strengthened international cooperation and partnerships, which is an important part of the Sendai Framework.

4. Relationship to GEO Engagement Priorities and to other Work Programme Activities

This activity will support the implementation of the Sendai Framework for Disaster Risk Reduction in general, especially the framework's priority areas of action 1 (*Understanding disaster risk*) and 4 (*Enhancing disaster preparedness for effective response*). By the derivation of Sendai indicators with satellite remote sensing and/or the Copernicus data and services, the activity supports the Sendai monitoring process, helps to understand and identify the disaster risks a country is facing and, thus, enables policy makers to increase preparedness for disaster response and recovery and ultimately strengthen disaster resilience.

The Community Activity will also inform the achievement and measurement of the SDG targets. By enabling countries to strengthen their disaster resilience through better and more consistent data on disaster risk and damage, the activity will contribute to the achievement and measurement of SDGs 1.5, 11.5, 11.b and 13.1. This activity will also support the objective of the Paris Agreement and its aim to strengthen resilience towards the adverse effects of climate change. By providing data and analyses on disaster risks in general, the activity will address the pillars of climate change adaptation and loss and damage associated with the impacts of climate change. The derivation of information from earth observation data for Sendai indicators can contribute to a comprehensive risk assessment and management and enhance a countries capacity to develop national adaptation plans or disaster risk management strategies.

Linkages to initiatives and activities from WPI 7–19:

Initiative: Data Access for Risk Management (GEO–DARMA)

Community Activity: Earth Observations for Disaster Risk Management

5. Governance

The community activity is led by the German Federal Office for Civil Protection and Disaster Assistance (BBK), Bonn, Germany. The activities will be initiated and orchestrated by the national coordination for the CEMS at BBK, in close cooperation with the German National Focal Point for the Sendai Framework for Disaster Risk Reduction (also at BBK). It is also planned to cooperate with UN–SPIDER to enhance and transfer knowledge on the integration of EO data in the Sendai reporting activities on an international level. It is envisaged to include development cooperation agencies, such as GIZ, in the activity to transfer generated knowledge and procedures

(e.g. good practice guidance) to support national governments of developing countries through bilateral cooperation to include EO in their Sendai monitoring processes.

As the activity focuses on developing guidelines, methodologies and procedures, as well as sharing knowledge and information for governmental end-users, interested organizations and governments are welcome to share their experiences. Support by other GEO members is very welcome; specifically this activity is open for exchange of knowledge and drawing from existing examples and projects of other member of PO.

6. Data Policy

The activity aims to use data from the European Copernicus Earth Observations Programme, which guarantees open and (cost)-free access to earth observation data. Developed methods and procedures comply with the GEOSS Data Sharing Principles and the GEOSS Data Management Principles. Options to make developed methods and procedures of this community activity available via DIAS platforms or GitHub are being examined. Developed methods and workflows will be made available through this activity; however, confidential information (e.g. confidential geodata) to test methods and generate indicators in Germany cannot be published.

Annexes:

I. Acronyms and abbreviations

BBK	Bundesamt für Bevölkerungsschutz und Katastrophenhilfe (Federal Office for Civil Protection and Disaster Assistance)
EO	Earth Observation
DIAS	Copernicus Data and information Access Platforms
GEOSS	Global Earth Observing System of Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
SDGs	Sustainable Development Goals
UNISDR	United Nations International Strategy for Disaster Reduction
UN-SPIDER	United Nations Platform for Space-based Information for Disaster Management and Emergency Response"

II. Brief CV of Project Leader(s)

Fabian Löw

Since 2018: Co-leader of working group-2 of the GEO Land Degradation Neutrality (LDN) initiative

Since 2018: Project leader of the Cop4Sen project at Federal Office of Civil Protection and Disaster Assistance (BBK), Bonn, Germany

Since 2015: Research officer and representative of the national coordinator for the Copernicus Emergency Management Service at BBK, Bonn, Germany

Since 2015: Remote sensing consultant at International Fund for Agriculture (IFAD) of the FAO, Rome, Italy

Since 2014: Remote sensing consultant at Geoinformatics Unit of the International Center for Agricultural Research in the Dry Areas (ICARDA), Cairo, Egypt

2014-2015: Post-doctoral fellow at Department of Remote Sensing of the German Aerospace Centre (DLR), Würzburg University, Germany

2010-2013: PhD student at Department of Remote Sensing, Würzburg University, Germany

2010: GIS analyst at Spang.Fischer.Natzschka GmbH, Walldorf, Germany

2004-2009: Diploma in Geography, Biology and Environmental Geochemistry

Laila Kühle

Since 2018: Research Officer “Cop4Sen” project at Federal Office of Civil Protection and Disaster Assistance (BBK), Bonn, Germany

2018: External Advisor at the German Federal Ministry of Economic Cooperation and Development (BMZ), Bonn Germany

2017 - 2018: Project Assistant at Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Bonn, Germany

2013 - 2017: Master of Science Geography

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