

Committee of Experts on Global Geospatial Information Management

Fourteenth session

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Item 3 of the provisional agenda

Enhancing global geospatial information management arrangements

Background document

Climate, environment and resilience

Summary

The Secretariat, in its report under agenda item 3 – Enhancing global geospatial information management arrangements of the fourteenth session, reports on efforts to enhance the effectiveness of the Committee of Experts. The aim is to foster coherence, collaboration and optimize resources. Those efforts support Member States in enhancing and sustaining leadership roles within national geospatial, mapping and cadastral agencies. The goal is to strengthen and enhance geospatial capacities and capabilities and promote knowledge-sharing towards enhancing effective and inclusive integrated geospatial information management arrangements nationally. This fosters the efficient sharing and utilization of geospatial information, crucial for decision-making, policy formulation and innovation, playing a vital role in addressing global challenges and achieving the Sustainable Development Goals. The focus is on creating an enabling environment where geospatial information can be effectively leveraged to leave no one behind and for the greater good.

The Committee of Experts also recognizes the profound impact that high-quality, accessible, timely, reliable geospatial data can have on efforts to understand and monitor the environment and make informed decisions that enhance resilience. The integration of geospatial information into environmental decision-making is essential for sustainable development and to address key global challenges such as climate change, biodiversity loss and ecosystem degradation. Harnessing the integrative capacities and power of geospatial data, policymakers can visualize complex climate dynamics, assess the vulnerability of ecosystems, and identify areas most at risk.

There is a need for a concerted, coordinated and coherent approach to climate, environment and resilience by the Committee that is underpinned by strategic objectives to drive forward understanding of the role integrated geospatial information management can play and should play, to support related policy development and decision-making. Taking a ‘joined up’ approach to climate, environment and resilience presents an opportunity to identify common data and information needs across this work and potentially reduce duplication of effort. It also creates an avenue to consider the interlinked nature and the intersection between integrated geospatial information with societal and economic resilience. In many instances, similar geospatial information and data will be required to assess risks, threats and vulnerabilities and inform decision-making for challenges caused by a changing climate, environmental degradation and increased disaster risk.

The Committee’s commitment to promoting the availability and application of high-quality, accessible, timely and reliable geospatial information will be important in supporting Member States to mitigate the impacts of our changing climate, protect the environment and develop a more resilient future for all. The report of the Secretariat, provided as a background document to this present report, underscores the importance of this effort and to catalyze actions amongst the Committee of Experts and relevant stakeholders. It is only through collective efforts, shared knowledge and effective partnerships that we can navigate the challenges ahead and chart our feasible path forward to a sustainable and resilient future for generations to come.

Introduction

The Committee of Experts discusses a diverse range of issues across its programme of work that relate to climate, the environment (including terrestrial, marine, coastal, and aquatic ecosystems), land administration, land management, land use planning, disaster risk reduction and sustainable development, among others. As noted in the discussion paper “Geospatial Information for Climate Resilience – What Does UN-GGIM Do?” prepared by the United Kingdom of Great Britain and Northern Ireland for the thirteenth session, the Committee has considered climate issues in its work since its inception in 2011. As an example, the decisions of the thirteenth session of the Committee of Experts contained fourteen references to “climate”, twelve to “resilience”, and three to “sustainable development” across eight separate decisions.

There is growing recognition of the role geospatial information can play to provide the evidence to support solutions to the challenges presented by climate change, ecosystem degradation, biodiversity loss and increased disaster risk. It is therefore anticipated that discussion on these issues will continue to expand under the Committee in the foreseeable future. There is thus an opportunity at the fourteenth session for the Committee of Experts to consider next steps and how best to structure the Committee’s future working arrangements on climate, the environment, disasters and resilience to ensure its work is:

- Underpinned by strategic objectives;
- Coordinated and coherent;
- Focused on collaboration and partnerships;
- Well-connected, using a ‘joined up’ approach that identifies and promotes synergies; and
- Flexible to respond to emerging needs.

Understanding ‘resilience’

The term ‘resilience’ is used across a range of disciplines with varying interpretations of its meaning. The origin of the term stems from a Latin verb to ‘rebound’. In modern terms, we often think of it as the capacity to ‘bounce back’ from adversity. It is essentially the capacity of something to cope with or recover from, an impactful event or a hazard. Building resilience is an iterative process, or a ‘cycle’ – generally its success can only really be ‘quantified’ after an event or hazard takes place.

Box 1: What is a hazard?

A hazard is defined in the Hyogo Framework for Action as a potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption, or environmental degradation (United Nations, 2005).

An event or hazard can be acute, such as disasters like earthquakes, wildfires and storms, or chronic (prolonged or longer term) such as sea level rise or desertification. Hazards can be natural (e.g., geological or hydrometeorological) or induced by human processes (e.g., environmental degradation and technological hazards).

As outlined by the Centre for Climate and Energy Solutions, building resilience requires an understanding of the potential threats and vulnerabilities caused by an event or hazard, as well as an understanding of the likelihood, impact, and consequences of it. Threats are potential actions that may cause damage or danger, whereas vulnerability is the degree of exposure to potential damage from the threat if it is to occur (Centre for Climate and Energy Solutions, 2019).

Generally, the system, community or society with the highest level of potential vulnerability will be the most impacted by the event or hazard when it occurs and is therefore predicted to have lower resilience compared to that which is considered less vulnerable. Economic and socio-demographic factors often contribute significantly to vulnerability and therefore higher or lower resilience (Centre for Climate and Energy Solutions, 2019).

Understanding what is meant by the term ‘resilience’ is important to help determine what actions could, should or must be undertaken and their associated information needs. In general, actions to build resilience are often localized or location-specific (i.e., pertaining to an asset, an ecosystem, a community or a region). The potential for location-specific geospatial information to support resilience efforts is therefore significant. Understanding the unique requirements for each specific case, the type of actions that could, should or must be undertaken as well as the information and data required to inform these decisions will be important and require engagement from a range of stakeholders.

Box 2: Examples of definitions of resilience

Climate resilience - Climate resilience is understood to be the ability of systems, communities or societies to prepare for and recover from events (or impacts) and hazards caused by climate change (Centre for Climate and Energy Solutions, 2019).

Disaster resilience - The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management (United Nations Office for Disaster Risk Reduction, 2015).

Ecological resilience - Ecological resilience is the capacity of an ecosystem to absorb repeated disturbances or shocks and adapt to change without fundamentally switching to an alternative stable state (Holling, 1973).

The importance of biodiversity and ecosystems

Climate, disaster and ecological resilience are closely interlinked and, in many cases, will require similar geospatial information to assess risks, threats and vulnerability and inform decision-making. The Intergovernmental Panel on Climate Change (IPCC) highlighted the interdependence of climate, ecosystems and biodiversity in their Sixth Assessment Report (IPCC, 2023) and noted that ‘safeguarding biodiversity and ecosystems is fundamental to climate resilient development’ (IPCC, 2022). Understanding how ecosystems and biodiversity can support climate and disaster resilience is important.

Nature provides essential ecosystem services to support people and our planet. It plays a key role in regulating the climate, absorbing and storing carbon, and protecting communities from extreme weather events and disasters as well as long-term changes in climate. Geospatial information has a key role to play to provide data to help decision-makers understand where, when and how to invest in biodiversity and ecosystems to build ecological resilience.

In their last report, the IPCC acknowledged the effectiveness of ecosystem-based approaches and nature-based solutions in reducing climate risks and impacts (IPCC, 2023). The Committee of Experts may wish to consider how geospatial information can support effective planning, implementation and monitoring of ecosystem-based approaches and nature-based solutions as this will be a growing area of interest in the coming years, particularly to support climate mitigation and adaptation efforts.

Box 3: Environment definitions

Ecosystem-based approach - A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (Convention on Biological Diversity, 1998).

Nature-based Solutions (NbS) - Actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits (United Nations Environment Programme, 2022).

Nature Positive – This is essentially the equivalent target for biodiversity to ‘net zero by 2050’ for climate. While there is no formal globally agreed definition of ‘nature positive’ as yet, it is generally understood to mean ‘halt and reverse the loss of nature by 2030’ measured from a baseline of 2020, with a full recovery expected by 2050 (Nature Positive Initiative, 2023).

There is also growing global interest in the pursuit of a ‘nature positive’ future which is supported by the landmark Kunming-Montreal Global Biodiversity Framework (adopted in 2022 under the Convention on Biological Diversity) with its mission to halt and reverse biodiversity loss by 2030 and put nature on a path to recovery by 2050. The Kunming-Montreal Global Biodiversity Framework contains four global goals and 23 targets for which many will require geospatial information to help implement, such as where can and should we place new protected areas, which areas of degraded land could be restored effectively, and where can we invest to get the most effective conservation outcomes. Two of the ambitious targets of the framework are to (1) conserve at least 30 per cent of land, waters and seas by 2030 (the ‘30 by 30’ target), and (2) restore at least 30 per cent of degraded ecosystems by 2030. Geospatial information can provide the tools and evidence to help determine where, when, why and how these targets can be achieved. The Committee of Experts may therefore wish to consider how geospatial information can contribute to global biodiversity goals and targets such as ‘nature positive by 2030’, the ‘30 by 30’ target, and the ecosystem restoration target, which will all rely heavily on geospatial information to inform decision-making.

Additionally, geospatial information, particularly marine geospatial information, is crucial to the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement) because it provides the foundational knowledge needed for effective ocean governance and conservation. This data helps identify and map critical habitats, biodiversity hotspots, and areas vulnerable to human activities, enabling the creation of marine protected areas (MPAs) and other area-based management tools. By understanding the spatial distribution of marine resources and ecosystems, policymakers can make informed decisions to ensure the sustainable use and conservation of marine biodiversity in areas beyond national jurisdiction. Integrated marine geospatial information management plays a vital role in monitoring and enforcing the provisions of the BBNJ Agreement. It supports environmental impact assessments (EIAs) by providing detailed maps and data on ocean conditions, necessary for evaluating the potential impacts of proposed activities. Additionally, this information facilitates the transfer of marine technology and capacity development efforts, ensuring that all countries, especially the Small Island Developing States, have the knowledge and means to participate in and benefit from the treaty's implementation. By integrating geospatial data into the BBNJ framework, the international community can better protect and manage the high seas, promoting the health and resilience of ocean ecosystems.

A strategic approach to climate, the environment and resilience for the Committee of Experts

Climate change, ecosystem degradation, biodiversity loss and increased disaster risk are interlinked challenges. Finding solutions to address these challenges is a global responsibility that requires engagement from all sectors. The Committee of Experts is well positioned to take a leadership role in setting the agenda for the development and use of geospatial information that can help address these global challenges, in partnership with decision-makers from the relevant fields.

Including a work stream under the Committee of Experts on the **environment** could be immensely valuable to ensure high-quality, timely, accessible, reliable and accurate foundational geospatial data is being used to address key environmental challenges such as biodiversity loss, ecosystem degradation, deforestation and pollution (air, plastic, water and land-based). The environment stream could be included under the same agenda item as climate and resilience.

The agenda item for future sessions could be named ‘Geospatial information for climate, environment and resilience’. The term ‘climate’ would convey the range of ways geospatial information supports the development of climate data and includes climate change. The term ‘the environment’ would help ensure sufficient flexibility under this stream for the Committee to determine priorities and be responsive to the needs of Member States. For example, the Committee of Experts may wish to consider how geospatial information can support Member States with their nature-based solutions or support in their implementation of the BBNJ Agreement in the first instance, and then in the future, it could consider other priorities such as land degradation, pollution or invasive species, etc.

Box 4: Climate definitions

Climate - Climate is the average weather conditions for a particular location over a long period of time, ranging from months to thousands or millions of years (World Meteorological Organisation, 2024).

Climate change - A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (United Nations Framework Convention on Climate Change, 1992)

It is proposed that there would be two streams under this agenda item for future sessions of the Committee

- a) A ‘resilience’ stream; and
- b) A ‘climate and environment’ stream.

A ‘resilience’ workstream

Resilience is cross-cutting and interlinked - climate, disaster and ecological resilience are closely interlinked and, in many cases, will require similar geospatial information and data to assess risks, threats and vulnerability and inform decision-making. Taking a ‘joined up’ approach to resilience presents an opportunity to identify common data and information needs across this work and potentially reduce duplication of effort. It also creates an avenue to consider the intersection between geospatial information with societal and economic resilience.

A ‘resilience’ stream could be led by a new working group ‘Geospatial information for resilience’ bringing together the Task Team on Geospatial Information for Climate Resilience and the Working Group on Geospatial Information and Services for Disaster that would work to ensure a strategic approach, identify synergies and commonalities in information and data needs, with a view to ‘map once, use many times’ and reduce the risk of duplication of effort across the UN-GGIM. This working group should work closely across the functional groups and thematic networks of the Committee to determine common strategic objectives and to consider the intersection between geospatial information and resilience holistically – including societal and economic resilience.

A ‘climate and environment work stream’

A ‘climate and environment’ stream could provide a strong coordination mechanism underpinned by strategic objectives and a work plan to drive forward the Committee’s engagement on all climate and environment-related issues. This can begin with the cross-functional group efforts on the integration of terrestrial, maritime, built and cadastral domains with the current focus on the land-sea interface and its technical complexities.

This could be led by a new working group on ‘Geospatial information for climate and environment’ that could promote the use of geospatial information for both climate and environment-related decision-making.

It could support geospatial information needs associated with climate and climate change and explore opportunities under agreements such as the Convention on Biological Diversity, the Kunming-Montreal Global Biodiversity Framework, the United Nations Convention to Combat Desertification and the new agreement on the conservation and sustainable use of marine biodiversity of areas beyond national jurisdiction (BBNJ), among others. It could boost the profile and strengthen understanding of the role of geospatial information to support climate and environment decision-making across a range of sectors.

A priority for the proposed working group on climate and the environment would be to consider how to combine climate and the environment into the implementation of the United Nations Integrated Geospatial Information Framework (UN-IGIF). Proposed priorities for the working group that would support the implementation of the UN-IGIF could include:

- Improving awareness and understanding of the vital and integrative role of geospatial information in climate and environment-related decision-making.
- Supporting integration of geospatial information into climate and environment policy and decision-making, particularly in developing countries.
- Strengthening and aligning national policies and technical capacities and capabilities to enable all countries to contribute environment and climate information to the geospatial information ecosystem.
- Supporting institutional collaboration, interoperability and integration across the various national data information systems and platforms that exist for climate and environment.
- Improving data management policies, practices, integration and analytical capacities for climate and environment-related data.
- Reducing organizational silos that result in data duplication, and the use of different standards, formats and classifications.
- Fostering improvements to data standardization, maintenance and integration for climate and environment-related data.
- Strengthening the availability and accessibility of geospatial data and platforms to environment and climate practitioners.
- Developing, strengthening and modernizing approaches to geospatial information management used for climate and environment, including policies and legal, governance, data integration and infrastructure, education, innovation, use and collaboration (UN-GGIM, 2023).

A focus on coordination, coherence, communication and partnership

Both the proposed working group on geospatial information for climate and the environment and the working group on geospatial information for resilience could play cross-cutting roles, prioritizing communication and collaboration across UN-GGIM to reduce the risk of silos. They could have a strong partnership focus, both within the UN-GGIM as well as across all relevant stakeholders.

Options for consideration by the Committee of Experts

The Secretariat invites the Committee of Experts to consider the options below on the Committee's future working arrangements on climate, environment, and resilience. These options are based on the Secretariat's observations of the need for a formalized cross-cutting coordination mechanism on climate and environment, and the need for a 'joined up' approach to resilience to enhance synergies and reduce duplication of effort.

Option 1: Rename the agenda item for future sessions to 'Geospatial information for climate, environment and resilience', and create two separate work streams under this agenda item for future sessions:

- a) A 'resilience' stream; and
- b) A 'climate and the environment' stream.

Option 2: Create a new working group on 'Geospatial information for resilience' bringing together interested members from the Task Team on Geospatial Information for Climate Resilience and the Working Group on Geospatial Information and Services for Disasters that will work across the Committee of Experts to ensure a strategic approach to resilience, enhance synergies and reduce any duplication of efforts.

Option 3: Create a new working group on 'Geospatial information for climate and the environment' that will coordinate and promote the use of geospatial information for both climate and environment-related decision-making.

These options should enable common approaches and data needs to be identified, and reflect the premise 'map once, use many times'. Developing the right enabling operating environment including the appropriate legal, regulatory and policy frameworks will allow the Committee of Experts to effectively promote its role in relation to climate, environment and resilience decision-making, which is important.

Appendix 1 - Works Cited

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