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Item 6 of the provisional agenda*
The future geospatial information ecosystem

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Note by the Secretariat

Summary of the report

The present paper contains the report of the Bureau of the Committee of Experts and the writing team on the future geospatial information ecosystem that was convened by the Bureau for consideration by the Committee of Experts on Global Geospatial Information Management.

At its fourteenth session, held from 7 to 9 August 2024, the Committee of Experts adopted decision 14/104, in which it welcomed efforts aimed at continuing to discuss and explore the future geospatial information ecosystem to assist Member States and their national geospatial information agencies in their thinking on how the global geospatial information community should be prepared to adapt to the rapidly changing geospatial information management landscape and its operating environment. The Committee also encouraged the Bureau and its writing team to consider the constantly evolving nature of the concept and scope of the future geospatial information ecosystem, to avoid a static definition and to focus on the understanding, purpose and use of geospatial information within the broader future digital ecosystem.

The Committee of Experts noted that new and emerging technologies and the growth and breadth of the data and digital ecosystems, of which geospatial information and services are a part, provided further opportunities to use geospatial information to address the complexities of national priorities, the 2030 Agenda for Sustainable Development, the post-2030 global development agenda and bridging the geospatial digital divide; and that a particular focus on trustworthiness within geospatial information management should be considered, and that the future geospatial information ecosystem should take advantage of the United Nations Integrated Geospatial Information Framework, with an emphasis on diversity, equality and inclusion as well as embracing innovative approaches, systems and technologies, including artificial intelligence and machine learning for societal benefits. Also at its fourteenth session, the Committee acknowledged the proposed principles and fundamental elements contained in the report and agreed to carry out further activities towards presenting a concept on the future geospatial information ecosystem with its scope, fundamental elements, principles and role within the broader digital ecosystem at the fifteenth session of the Committee of Experts.

In the report, the Secretariat and the Bureau present the intersessional activities of the writing team on the future geospatial information ecosystem on the development of a position paper on the future geospatial information ecosystem.

* E/C.20/2025/1.

According to the report, the writing team met at least monthly to advance the position paper and to conduct a series of activities aimed at exploring the latest trends, rapid technological changes, actors, cross-sector developments and new policies affecting both the wider digital ecosystem and the role of geospatial community within it. In its activities, the team sought to maximize inputs and views on the future geospatial information ecosystem and beyond in the broader digital ecosystem, including through a global webinar that brought together a wide range of actors, a global survey inclusive of communities beyond the geospatial community and a global consultation to include diverse perspectives on the future geospatial information ecosystem.

The report of the writing team is accompanied by a background report in which the team presents a proposed position paper on the future geospatial information ecosystem. In the paper, the team acknowledges the inherent evolving nature of the future geospatial information ecosystem, includes information on drivers, principles and fundamental elements of the future geospatial information ecosystem, building on the Integrated Geospatial Information Framework, and embraces diversity, equity and inclusion, while providing future-looking considerations on the rapidly evolving digital landscape.

The report also contains details on perspectives and options for the Committee of Experts to consider regarding the need for and relevance of continuously exploring trends, innovative approaches, systems and technologies in the rapidly evolving digital landscape and regarding the need for and relevance of preparing the geospatial community and national geospatial information agencies to contribute to and shape the future geospatial information ecosystem within the broader digital ecosystem.

I. Introduction

1. In 2021, at its eleventh session, the Committee of Experts added the agenda item on Determining the Future Geospatial Information Ecosystem to the provisional agenda for its upcoming twelfth session following the considerations on the United Nations Integrated Geospatial Information Framework related to the importance of the interlinkages of the Framework with other emerging trends, shifts in the geospatial landscape and complementary initiatives that would ultimately extend the Framework's relevance in the future geospatial information ecosystem. The complexity of the future geospatial information ecosystem and its far reaching implications in the wider digital ecosystem were highlighted in a background paper entitled Towards a sustainable geospatial ecosystem beyond spatial data infrastructures.

2. In 2022, the agenda item on Determining the future geospatial information ecosystem was accompanied by two background documents entitled Future Geospatial Information Ecosystem: From SDI to SoS and on to the Geoverse and the Future National Geospatial Information Ecosystem as an exploration of the geospatial landscape and to assist Member States and national geospatial information agencies in their thinking on future geospatial environments in which technological developments will play a crucial role. In making decision 12/102, the Committee of Expert acknowledged "that determining the future geospatial information ecosystem was a timely and strategically important topic to consider […] and to understand how the future ecosystem would link to the work already carried out by the Committee, including the Integrated Geospatial Information Framework". It further noted that a "continuing discussion on 'geospatial information ecosystem' was necessary for the global community, with the aim of explaining and expanding the role of geospatial information in technological advancements and society in general".

3. In 2023, in making decision 13/10, the Committee "agreed that the definition and development of future geospatial ecosystems was an opportune activity to undertake but that it required further scoping and consensus to identify and describe what the foundations of future geospatial ecosystems would encompass within the purview of the Committee […]" and further supported the proposals "to entrust the Bureau, supported by a writing team, with developing a position paper on determining the scope and an outline on the fundamental elements and principles of the future geospatial information ecosystem for the consideration of the Committee of Experts at its fourteenth session, and welcomed the multiple offers by Member States to support the Bureau."

4. In 2024, in making 14/104, the Committee "encouraged the Bureau and its writing team to consider the purpose and actors as the main drivers of the future geospatial information ecosystem, to undertake broad global consultation to maximize inputs and views from the Committee of Experts and relevant stakeholders, to include diverse perspectives and positions of a future geospatial information ecosystem within the broader digital ecosystem, and to embrace the understanding of a future geospatial information ecosystem as a journey rather than a deliverable". The Committee of Experts further "acknowledged the proposed principles and fundamental elements contained in the report (E/C.20/2024/8/Add.1) prepared by the Bureau and its writing team as an initial step for conceptualizing the future geospatial information ecosystem, and agreed to carry out further activities towards presenting a concept on the future geospatial information ecosystem with its scope, fundamental elements, principles and role within the broader digital ecosystem at the fifteenth session of the Committee of Experts."

5. The Committee of Experts noted on repeated occasions the critical importance and impact of new and emerging technologies, the growth and breadth

of the data, and the ever-increasing interconnectedness of solutions and digital ecosystems. These rapid changes in the digital infrastructures and ecosystems provide both challenges and opportunities for geospatial information to contribute to solving the complexities of national priorities, the 2030 Agenda for Sustainable Development, the post-2030 global development agenda, and bridging the geospatial digital divide. As such, considering the "direction of travel" of the geospatial information ecosystems and its role is critical. The Committee recalled in its recent years' decision the paramount role it should play in shaping the future digital ecosystem and contributing to it. The Bureau and the writing team, cognizant of this imperative need for foresight, conducted activities to conclude the preparation of a position paper on the future geospatial information ecosystem. The position paper is not an end point as it acknowledges the future geospatial information ecosystem is a "moving target" that represents a journey that would require continued adaptations and require the constant incorporation of new ideas, purposes, technologies and collaboration to adapt to a rapidly evolving wider digital ecosystem.

II. Organization of work

6. During the intersessional period, the Bureau and the Secretariat convened a series of meetings at least on a monthly basis to discuss further the concept and elements of the future geospatial information ecosystem within the wider digital ecosystem. The team also organized the work towards the delivery of the paper for determining and positioning the future geospatial information ecosystem. The Bureau and its writing team, in accordance with the guidance of the Committee of experts, discussed activities to undertake engagement activities and consultations to maximize inputs and views from the geospatial community and a wide range of stakeholders and to include diverse perspectives and outlooks on the future geospatial information ecosystem within the wider digital ecosystem.

7. To further advance the concept and elements of the future geospatial information ecosystem, the Bureau and the writing team developed and implemented a 25-week structured work programme aimed at continuing to define the principles, goals and foundational elements of the ecosystem within the wider digital ecosystem. The programme included the organisation of a technical workshop to elaborate key priorities and build upon the previously discussed principles and foundational elements, the preparation and hosting of a global online seminar in collaboration with a broad range of partners to solicit inputs and share perspectives, the design and implementation of a global survey to assess developments across the wider digital ecosystem, and the drafting of the outline of the position paper on the future geospatial information ecosystem.

8. During the discussions of the workshop, the Bureau and its writing team built on the initial work on principles and fundamental elements of the future geospatial information ecosystem and further discussed overall policy context, such as the Pact for the Future and its accompanying Global Digital Compact, the future agendas, the variety of actors participating to the wider digital ecosystem, and emerging technologies and trends impacting the rapidly evolving geospatial landscape. The workshop was instrumental in setting the activities of the 25-week programme including timeline and milestones for the webinar, the survey and the drafting of the position paper on the future geospatial information ecosystem.

III. Global webinars

9. In accordance with its findings presented in the report of 2024 (E/C.20/2024/8/Add.1), the Bureau and its writing team recommended to foster dialogue on the future digital and geospatial information ecosystem. The active participation of various actors from government, private sector, academia, the civil

society, was considered key to considering the needs and perspectives of the wider community on the future geospatial information ecosystem. To deepen the conversation and engage with a broader group of stakeholders rather than the geospatial community alone, the team decided to hold a global online webinar to understand the ramifications, complexities, multifaceted aspects, and interconnected elements of the future geospatial information ecosystem, and beyond the wider digital ecosystem. The writing team decided to conduct a global webinar on the theme "Exploring the wider digital ecosystem" to engage a broad range of stakeholders and explore policies, diversity of actors, technology trends and innovation in the digital ecosystem with the aim to define further the role of the geospatial information ecosystem within it. The theme was purposely broad and not specific to geospatial information expertise to ensure a wider engagement of communities beyond the geospatial.

10. The webinars aimed:

(a) to foster global dialogue and stakeholder engagement with international experts, national offices, technology specialists, private sector, academia, legal and policy professionals and other stakeholders to engage in discussions on trends, challenges, and opportunities related to the digital ecosystem and transformation;

(b) to explore future trends for addressing global challenges and in particular consider how digital transformation, including geospatial information, can address national priorities, accelerate the implementation of the 2030 Agenda for Sustainable Development, and contribute to shape the post-2030 global development agenda; and

(c) to inform future strategies by gathering key insights, guidance, and recommendations emerging from the seminar to design approaches, orientations, principles and priorities to enhance digital transformation and contribute to global data governance.

11. By conducting the webinars and considering these objectives, the writing team sought to advance perspectives and insights in the development of a transformative, sustainable, inclusive, purpose-driven and forward-looking digital ecosystem that effectively addresses global challenges and opportunities.

12. The webinars led by Canada on 18 and 19 March 2025 to maximize outreach across time zones, were successful in bringing over 250 participants worldwide with interventions from thought leaders, policymakers, innovators, professors, geospatial professionals and private sector experts from around the world. The webinar explored a variety of topics in the digital ecosystem. The first webinar on 18 March 2025 provided insights on the direction of the digital ecosystem including on: expanding global collaboration and strengthening partnerships among governments, private sector actors, academia, and civil society; addressing the data and digital divide and promoting equitable access to geospatial data for all Member States and communities; driving innovation and technologies (GeoAI, digital twins, blockchain, and space-based technologies to enhance geospatial capabilities); investing in geospatial infrastructure; advancing policy and good governance; and enhancing education and capacity development. The second webinar on 19 March 2025 was organized and structured around the strategic pathways of the United Nations Integrated Geospatial Information Framework, key recommendations and recommendations included to consider geospatial information as a critical digital foundation and infrastructure that must address priorities and enable smarter decisions across sectors (such as health, agriculture, education, environment, resilience or disaster management); to develop collaboration in the ecosystem to leverage a variety of actors and expertise; to ensure legal and governance framework and safeguards are present to ensure a healthy digital ecosystem; and to ensure everyone, everywhere can reap the benefits of the digital world.

13. Therefore, from the webinar, the writing team considered that the future geospatial information ecosystem was driven by three fundamental changes. The three fundamental shifts included that the wider digital ecosystem was to be purpose-driven, its design and evolution needed to be centred around the urgent need to solve global challenges, people-centred to address the imperative to ensure equitable access to knowledge to everyone, everywhere, and finally partnership-oriented to engage and co-design with a wide range of actors across countries and sectors, fostering digital cooperation and bridging the geospatial digital divide.

IV. Survey of the wider digital ecosystem

14. Following the global online webinar, the Bureau and its writing team continued to unfold their 25-week programme and turned to the organization of a survey on mapping the wider digital ecosystem, as a means to further scope and understand the ramifications and role of the future geospatial information within it. Similar to the global webinars, the survey did not focus only on geospatial information management but also covered policy, technology, data, infrastructure, and solution considerations. The survey, led by Saudi Arabia, was designed as a 20-question survey in April 2025, and was subsequently rolled out between 13 May to 13 June 2025 reaching both the geospatial community, digital community, international organizations as well as participants who attended the global online webinar, inviting them to also forward the survey to relevant partners.

15. The survey sought to gather diverse perspectives on the strategic priorities, challenges, governance frameworks, and emerging technologies shaping the future digital ecosystem. The survey was also designed to ensure that responses would directly contribute to strategic foresight efforts on positioning and shaping the future digital ecosystem by Member States, international organizations, industry stakeholders, academia, and civil society.

16. The result reached near to 250 respondents from across the world. The survey successfully reached its goal of providing a variety of perspectives from different expertise including a strong perspective from Member States as 41% of the responses came from public agencies, 23% from academia and research institutions, 18% from the private sector including technology companies, 12% from civil society or non-governmental organizations, and 6% from multilateral international agencies or United Nations entities. Over 70% of the responses originated from the Global South, with 38% from Africa, 21% from Asia Pacific, and 13% from Latin America and the Caribbean.

17. The survey provided perspective and key findings on challenges towards a purpose-driven, people-centred, and partnership-oriented future geospatial information ecosystem. The key challenges identified were: siloed systems, with the fragmentation of institutional architectures across agencies which delays decisions and blocks innovation; missing legal guardrails, with too often no clarity on who owns what data—or who's accountable for misuse; systems without skills, as the technology is available but major capacities and systems far behind; gaps in governance, where human rights principles need to be integrated into the design of the future (geospatial) digital ecosystem, with safeguards for inclusion, protection and multilateralism; delivery of services, rather than conceptual frameworks that fail to translate into operational action and tools; interoperability, beyond technical interoperability, legal and institutional operability must prevail; regional priorities and inequalities prevail in the use of Artificial Intelligence (AI) with over of 25% raising ethical concerns on its usage; accessibility to technology; and finally, legal enforcement for data remains a contentious or unfamiliar concept in non-governmental domains.

18. The survey also identified a wide array of critical priorities for investing in a digital ecosystem that is not only technologically advanced, but also inclusive,

ethical, and sustainable. Key focus areas included building robust digital infrastructure, fostering digital skills across all segments of society, establishing strong governance frameworks, promoting open standards, driving innovation, ensuring equitable access, and embedding environmental sustainability into digital developments. These priorities are considered elements that contribute to create a future-ready ecosystem that benefits all communities and the government.

19. Regarding the financial mechanisms, the survey noted that government investment still plays the most significant role, followed by private investment, though this perspective may be weakened by the fact that survey respondents were predominantly from government agencies (41%). Other important financial mechanisms included data cooperatives, support from financial institutions, philanthropy and foundations, subscription fees and licensing models, and the tokenization of data and services. Additionally, there are emerging and alternative approaches being explored to further enhance the ecosystem

20. Finally, the survey indicated that ensuring equitable access and participation in the global digital ecosystem demanded more than just infrastructure, as it requires an intentional, multi-dimensional strategy that bridges connectivity gaps, promotes digital literacy, fosters inclusive governance, and empowers marginalized communities. The survey highlighted that key priorities include expanding affordable digital infrastructure, ensuring access to devices and connectivity, and building local capacity through education and skills development. Also, considerations included that policies must provide safeguards to privacy, promote open data, and reflect diverse voices. Further, the survey highlighted that platforms should be user-centric, accessible in multiple languages, and culturally relevant. Public-private partnerships, global cooperation, and open standards were deemed critical to enable equitable participation for all. Ultimately, the survey provided a conceptual view of a fair, responsible, and inclusive digital ecosystem built on trusted, transparent, and accessible data that caters to addressing societal priorities, ensuring shared benefits, enabling transformation, and growing inclusive approaches.

V. Position paper

21. To prepare the position paper on the future geospatial information ecosystem the writing team leveraged the papers and various background documents presented at the eleventh and twelfth sessions on the future geospatial information ecosystem, as well as the policy papers presented in 2020, 2015 and 2020 on Future Trends by the United Kingdom.

22. The drafting and writing of the position paper, led by South Africa, also leveraged the previous work of the team on the future geospatial information ecosystem previously undertaken regarding strategic drivers as presented in its report of 2023 (E/C.20/2023/8/Add.1), and scope, principles and fundamental elements of the future geospatial information ecosystem as presented in its report of 2024 (E/C.20/2024/8/Add.1). A draft outline was prepared from May to June 2025 that incorporated these foundational pieces of work and considered the additional perspectives and insights gathered during this intersessional period through the global online webinars and the global survey. These findings were used to refine principles, elements and considered activities to design, shape and advance the role of geospatial information within the broader digital ecosystem.

23. The position paper was structured using the strategic pathways of the United Nations Integrated Geospatial Information Framework, recognizing its essential role in developing, enhancing and advocating for the efficient production and effective utilization of geospatial information. Finally, the position paper also incorporated an emphasis on diversity, equality and inclusion as well as embracing

innovative approaches, systems and technologies, including artificial intelligence and machine learning for societal benefits.

24. The delivery of the work program culminating in the position paper entitled "Positioning future geospatial information ecosystem" concludes the work and deliverables of the Bureau and its writing team on the future geospatial information ecosystem and the tasks set out in accordance with decision 13/10, 14/104 of the Committee of Experts and its Terms of Reference.

25. In finalizing the position paper on the future geospatial information ecosystem, and in presenting the documents to the Committee of Experts, the Bureau and the writing team consider these actions completed. The position paper offers insights into the rapidly evolving digital landscape, actors, dynamics, and emerging technologies to further this, it provides some considerations on how to advance, shape and continue to position the future geospatial information ecosystem within the broader digital ecosystem.

VI. Next steps

26. In delivering the position paper entitled "Positioning future geospatial information ecosystem", the Bureau and its writing team outline critical next steps for the Committee of Experts to consider towards further advancing and shaping the future geospatial information ecosystem, including:

(a) Ongoing foresight and future-looking journey: Ensure foresight and future-facing activities are part of the Committee of Expert forward-looking agenda and journey, enabling Member States to remain at forefront of digital transformation, remain nimble in a rapidly evolving and disruptive digital landscape, and continue to be agile in adapting the role of geospatial information management within it.

(b) Deepen engagement and dialogue: Continue fostering inclusive discussions among Member States, regional committees, functional groups, and actors and in the wider digital ecosystem, to test and evolve its perspectives, strategic imperatives, principles, and foundational elements to continuously and advantageously position the future geospatial information ecosystem.

(c) Align with broader global digital agendas: Position the future geospatial information ecosystem as a key enabler of broader international initiatives, including the 2030 Agenda for Sustainable Development, the Global Digital Compact, data strategies, post-2030 agenda, and future global agendas.

(d) Enhance cross-sector collaboration: Promote broader engagement with digital economy sectors, smart infrastructure initiatives, emerging technology communities and civil society actors to ensure an integrated approach.

(e) Pilot innovative approaches: Encourage pilot projects that apply future-oriented practices, such as machine-readable SDIs, tokenization, decentralized funding models, AI-driven data ecosystems and participatory, rights-based governance models that prioritize transparency, accountability and public trust.

(f) Strengthen capacity and knowledge sharing: Establish platforms for Member States to share lessons learned, good practice and innovation experiences, particularly emphasizing support for developing countries.

(g) Develop priority use cases: Identify and promote use cases that demonstrate how the future geospatial information ecosystem can deliver real-time knowledge, support decision-making, and address pressing public policy, and environmental and societal challenges.

27. Any combination of these proposed activities would contribute to continuous positioning towards the future geospatial information ecosystem and for the Committee to continue to take an active role in shaping and engaging with a broad community to ensure it remains current and in-sync with a variety of actors, policies, and data, and to foster partnerships across sectors, expertise and technologies. The Bureau and its writing team recognize the relevance of continuing the journey and to conduct future-facing activities with the intent of helping national geospatial information agencies, in their thinking and as essential actors in the geospatial ecosystem to assure the global geospatial information community grows its influence, continuously adapts to, and derives benefit from the rapidly changing global digital information ecosystem and its operating environment.

VII. Points for discussion

28. The Committee of Experts is invited to:

(a) Take note of the present report and express its views and perspectives on how the global geospatial information community should prepare and adapt to the rapidly changing digital and geospatial landscape and its operating environment;

(b) Take note of the efforts from the bureau and the writing team to explore and position the future geospatial information ecosystem as a continuous journey, and to engage stakeholder within the wider digital ecosystem;

(c) Take note of the position paper delivered by the Bureau and its writing team and as express its views on the successful completion of the tasks set for the writing team and its delivery with the position paper on "Positioning the future geospatial information ecosystem" according to decision 13/10, 14/104 of the Committee of Experts, and its Terms of Reference and provide guidance and concurrence regarding the cessation of its activities having successfully achieved its objectives;

(d) Take note of the proposed next steps and considered activities for continuing the journey of positioning and shaping the future geospatial information ecosystem and to remain nimble to rapidly evolving digital landscape and agile in adapting the role of geospatial information management within it; and

(e) Express its views on the need to continue proposed activities and next steps under the future geospatial information ecosystem agenda item.