United National Global Geospatial Knowledge and Innovation Centre

Geospatial Knowledge and Innovation Week 2024

"Geospatial IDEAS Benefiting Our World"

Deqing, China, 21-24 October 2024

Summary report

Background

The United Nations Global Geospatial Knowledge and Innovation Centre (UN-GGKIC) convened its Geospatial Knowledge and Innovation Week (GeoNOW 2024) in Deqing, China, 21-24 October 2024. event with the theme "Geospatial IDEAS Benefiting Our World" brought together over 700 participants from over 40 countries, including representatives from UN-GGIM regional committees and thematic networks, United Nations systems, research institutions, private sectors, non-governmental organizations and local government agencies.

The GeoNOW 2024 aimed to provide a global forum to:

1) **Inspire Innovative Thinking**: encourage cross-industry and cross-border cooperation and innovation, discovering new ideas and methods for using geospatial information in addressing global challenges, providing scientific and technological support for the SDGs
2) **Design modern and inter-connected Application:** promote geospatial information applications and interoperable networks of services, fostering close cooperation among governments, businesses, academia, and non-governmental organizations to accelerate the application of geospatial information outcomes
3) **Strengthen Capacity Development:** through training and seminars, strengthen global capacity, particularly in developing countries, for acquiring, processing, analyzing, and applying geospatial information, bridging the geospatial digital divide
4) **Promote International Exchange:** create a bridge for international cooperation, sharing successful use cases and good practices, enhancing mutual understanding in the field of geospatial information, and jointly addressing global challenges.

The GeoNOW 2024 commenced with the **United Nations Conference on Geospatial Knowledge Applications** and concluded with the **International Symposium on Leadership Development for Global Geospatial Knowledge**. The event showcased the transformative potential of geospatial knowledge and innovation through the **"Moganshan Talks,"** which featured thematic discussions on diverse applications. Each forum incorporated expert presentations and interactive roundtable discussions, fostering actionable insights and paving the way for future think tank and research initiatives. The comprehensive agenda included:

1) Opening Ceremony and Keynote Presentations
2) <u>Moganshan Talks # 1:</u> Digital Twins and Smart Cities
3) <u>Moganshan Talks # 2:</u> Smart Farming and Food Security
4) <u>Moganshan Talks # 3:</u> Natural Resources Investigation and Territorial Spatial Governances
5) <u>Moganshan Talks # 4:</u> Clean Energy and Green Development
6) <u>Moganshan Talks # 5:</u> Climate Change and Disaster Risk Reduction
7) <u>Moganshan Talks # 6:</u> Geo-modelling and Geospatial Intelligence
8) International Symposium on Leadership Development of Global Geospatial Knowledge
9) Think Tank Initiatives
10) Closing Ceremony

1. Opening Ceremony and Co-located events

The event was opened with a welcome remark by Mr. Navid Hanif, Assistant Secretary-General for Economic and Social Development, who noted that the "GeoNOW" event was both a recognition of the critical role that geospatial information, its science, technologies and innovation, plays in addressing global challenges—and a call for the urgent and decisive actions that our world needs now. The event, co-organized with the Government of China, had opening remarks from Mr. Guohong Liu, Vice Minister, Ministry of Natural Resources of the People's Republic of China and local government officials from Zhejiang Province and Huzhou City.

The opening ceremony was followed by a series of keynote presentations delivered by:

Mr. Dejan Jakovljevic, Food and Agriculture Organization of the United Nations (FAO), who emphasized the role of geospatial information in addressing global challenges like hunger and poverty, highlighting the integration of digital tools in agriculture and food systems. He highlighted FAO's efforts in using geospatial data platforms for sustainable development, with particular attention to improving food security and enabling investments in developing nations through open-access technologies.

Ms. Tiziana Bonapace, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), who discussed the importance of leveraging information and communication technologies (ICT) for disaster risk reduction and sustainable development in Asia and the Pacific. She highlighted regional cooperation and the integration of digital solutions to enhance resilience and bridge the digital divides, emphasizing the role of geospatial information in addressing environmental and social challenges.

Mr. Jixian Zhang, Moganshan Geospatial Information Laboratory, focused is presentation on innovations in geospatial information and its applications in smart cities and urban planning. He stressed the integration of geospatial technologies with policy and institutional frameworks to address urban challenges, enhance governance and promote sustainable development.

The GeoNOW 2024 was co-located with two other events: a) a workshop on Enhancing the Management of Geospatial Data for Disaster Risk Reduction and Sustainable Development organized by ESCAP and b) the Global Symposium on Data and Digital Governance organized by the Department of Economic and Social Affairs (DESA) of the United Nations. The workshop addressed challenges in implementing national digital data governance frameworks, focusing on enhancing institutional capacities to manage and govern data effectively. It supported developing countries, particularly in Africa and Asia and the Pacific, in building comprehensive and evidence-based data governance frameworks through regional and global cooperation.

The ESCAP Global Symposium focused on addressing challenges in utilizing geospatial data for sustainable development and disaster risk reduction in the Asia and the Pacific. Organized by the ESCAP and the United Nations Global Geospatial Information Management Regional Committee for Asia and the Pacific (UN-GGIM-AP), it brought together experts to conceptualize a regional geospatial data hub, fostering collaboration, knowledge-sharing, and improved data governance. The meeting aimed to enhance geospatial data sharing practices, strengthen partnerships, and contribute to building a networked hub to bridge the geospatial digital divide and support socio-economic prosperity across the region.

2. Moganshan Talks # 1: Digital Twins and Smart Cities

The Moganshan Talks on Digital Twins and Smart Cities focused on the integration of digital twin technology within urban development frameworks to promote the establishment of smart and sustainable cities. Key topics included utilizing digital twins for real-time urban planning, strengthening resilience and enhancing urban infrastructure. Panelists explored the capacity of digital twins to simulate urban dynamics, enable data-informed decision-making and optimize resource management.

One panelist highlighted the role of digital twins in monitoring urban systems, from transportation networks to energy grids, applying data for predictive maintenance and crisis response. There was consensus on the necessity of international collaboration and standardized data-sharing frameworks to facilitate interoperability of digital twin models across borders. Furthermore, the discussion underscored the need for robust policy support, rigid data privacy measures and secure technological frameworks to safeguard citizens' data while fostering innovation.

The panel also emphasized the importance for cities to adopt scalable and adaptive digital twin platforms that can evolve with technological advancements and meet diverse urban requirements, thereby advancing the achievements of the Sustainable Development Goals (SDGs).

3. Moganshan Talks # 2: Smart Farming and Food Security

This session focused on harnessing advanced technologies to address global food security and promote sustainable agricultural practices. Panelists included distinguished experts in fields such as agricultural robotics, Earth observations (EO) and Artificial Intelligence (AI). The dialogue underscored the importance of integration of geospatial information with emerging technologies to enhance precision and efficiency in agricultural management. Key takeaways included the need for:

1) *Enhanced Data Accessibility:* Strengthening data accessibility and interoperability between systems to facilitate broader usage by both smallholder farmers and large-scale agricultural enterprises.
2) *Use of EO and AI:* These technologies are crucial for monitoring crop health, soil conditions and water resources. Panelists emphasized the advantages of real-time EO data in water resource management, particularly in regions vulnerable to drought.
3) *Training and Simplification of Technology:* Experts underscored the importance of capacity-building initiatives to equip farmers with the skills to effectively utilize new technologies. For instance, unmanned agricultural machinery and precision farming techniques which require user-friendly interfaces and comprehensive training to ensure widespread adoption.
4) *International Cooperation:* The panel stressed the importance of a global agricultural knowledge-sharing network to support countries with limited technological resources, thereby contributing to the stabilization of food production and addressing challenges posed by climate change.

The session concluded with discussions on a think tank dedicating to research and supporting the SDG #2-Zero Hunger. This think tank could provide innovative approaches and methods on geospatial technology implementation and addressing regional agricultural challenges across diverse geographic contexts.

4. Moganshan Talks # 3: Natural Resources Investigation and Territorial Spatial Governances

The session on Natural Resources Investigation and Territorial Spatial Governance addressed several priority areas related to the sustainable management and governance of natural resources. Key points discussed include:

1) *Inventory and Monitoring of Natural Resources:* The panel underscored the critical role of assessing and systematically monitoring natural resource inventories, with specific attention to land tenure and ownership rights. Emphasis was placed on developing standardized recording systems and utilizing geospatial information to strengthen resource management capacities.
2) *Advanced Remote Sensing Techniques:* Participants presented advanced practices involving remote sensing technologies for real-time data acquisition and analysis. These technologies are instrumental in monitoring land use patterns and integrating management frameworks, thus enabling more informed and effective planning.
3) *Climate Change Responses:* The discussion highlighted the need for integrating geospatial and temporal data to support climate action. Such integration is essential to making evidence-based decisions on land use and environmental stewardship in the context of climate adaptation and resilience.
4) *International Experiences:* Participants shared global perspectives and good practices, with Brazil's rural environmental registry cited as a valuable model for enhancing land management strategies and regulatory frameworks.
5) *Integration of Data and Systems:* The discussion considered the necessity of a unified system for consolidating land and natural resource records. Strengthening data interoperability across sectors and agencies is essential to promote effective governance and coherent policy implementation.
6) *Balancing Land Development Needs:* The dialogue underscored the need to balance development and conservation imperatives, with geospatial information management playing a central role in ensuring sustainable land use that respects ecological thresholds.
7) *Future Directions:* There was a shared commitment to learning from global practices and integrating innovative solutions to enhance territorial governance and sustainability. Continuous adaptation and knowledge sharing were recognized as critical to advancing sustainable development goals.

The panel highlighted the complex challenges and opportunities in natural resources governance, underscoring the pivotal role of geospatial information systems in achieving the SDGs.

5. Moganshan Talks # 4: Clean Energy and Green Development

The session on Clean Energy and Green Development focused on advancing clean energy and sustainable mining practices. Key topics included:

1) *Renewable Energy Technologies and Challenges:* Experts underscored the critical importance of renewable energy sources, including geothermal, wind, solar and hydrogen. The discussions highlighted recent advancements in these technologies and addressed the role of energy storage, smart grids and policy frameworks in fostering widespread adoption. Key topics included the integration of renewable energy into existing infrastructure and the necessity for adaptable frameworks to support future energy demands.
2) *Critical Minerals for Clean Energy:* Recognizing that clean energy technologies—such as solar, wind and electric vehicles—are heavily reliant on minerals like lithium, nickel, cobalt and rare earth

elements, the panel highlighted the urgent need for sustainable and resilient mineral supply chains. The rapid increase in demand for these resources has elevated their significance as pivotal to achieving global climate targets. Additionally, the discussion underscored the importance of ensuring equitable resource distribution and benefit-sharing across the supply chain.

3) *Environmental and Social Impacts:* Panelists explored the ecological and social implications of clean energy development, with attention to impacts on biodiversity and wildlife migration patterns. China's approach, which includes stringent environmental regulations and designated "red lines" for conservation, was presented as a potential model for achieving a balance between sustainable development and environmental preservation.

4) *Policy and Global Cooperation:* The discussion emphasized the necessity of enhanced international collaboration to promote clean energy and sustainable mining. The panel highlighted the importance of policies that advance sustainable practices, particularly in geologically sensitive areas. The role of geospatial technologies in planning and identifying optimal locations for renewable energy projects, while avoiding ecologically vulnerable zones, was also stressed.

The panel acknowledged significant advancements in clean energy and sustainable mining. However, it called for strengthened policy coordination, technological innovation and international partnerships to address ongoing environmental and resource management challenges effectively.

6. Moganshan Talks # 5: Climate Change and Disaster Risk Reduction

This session addressed critical challenges and strategic actions needed to mitigate the impacts of climate change globally. Key discussions included:

1) *Global Climate Challenges:* Experts underscored the rising frequency and severity of extreme weather events driven by climate change, posing significant risks to ecosystems and human populations. This growing threat underscores the urgency for coordinated international action and the implementation of advanced risk management frameworks.

2) *Use of Spatio-Temporal Information Technology:* The panel highlighted the vital role of geospatial information and remote sensing technologies in identifying vulnerable areas, assessing disaster risk and enhancing early warning systems. Experts advocated for advancements in the speed and efficiency of data collection and processing to enable timely disaster prevention and mitigation.

3) *Integrated Disaster Management:* Experts, including representatives from multiple countries, shared successful case studies on disaster response strategies. For instance, satellite monitoring and predictive models powered by AI have proven effective in identifying risks such as landslides and extreme rainfall. This data-driven approach supports rapid response efforts, particularly in regions vulnerable to complex disasters like floods and landslides.

4) *Proposed Global Frameworks and Tools:* Discussions also focused on considering a global "spatio-temporal information ecosystem" to bolster emergency response capacities and envisaged how a framework would enable real-time data sharing, improve predictive models and support coordinated international disaster response initiatives.

5) *Climate Adaptation and Mitigation Synergies:* Panelists emphasized the importance of aligning adaptation measures with long-term sustainability objectives, suggesting policies that balance disaster risk reduction with economic and social resilience. They advocated for integrating climate adaptation and mitigation strategies to reduce the overall impacts of climate change.

The forum concluded with calls to strengthen geospatial information, data management and related infrastructure and enhance cross-border cooperation, both of which are essential for building resilience in the midst of intensifying climate-related risks globally.

7. Moganshan Talks # 6: Geo-modelling and Geospatial Intelligence

The session on the Geo-modelling and Geospatial Intelligence focused on the integration of AI with geospatial technologies and the unique challenges involved. Key discussions included:

1) *AI and Geospatial Data:* Experts highlighted the complexities of employing AI to interpret the distinct spatio-temporal characteristics of geospatial data. They emphasized that effective integration necessitates a nuanced understanding of these specific attributes, as conventional AI approaches may not fully account for them.
2) *Sector-specific Applications:* Participants stressed the need for tailored AI solutions designed to enhance geospatial applications rather than applying generic AI models. The objective is to harness AI capabilities that support geospatial analysis by aligning with sector-specific requirements and inherent complexities.
3) *Practical Implications and Future Trends:* The panel underscored the critical role of ongoing research in advancing foundational knowledge of AI-geospatial systems, which can facilitate more robust integration. Such advancements in AI could become transformative tools for accelerating progress on the SDGs through improved decision-making and spatial data insights.
4) *Strategic Leadership in GeoAI:* From both academic and regional perspectives, the importance of strategic leadership in GeoAI was emphasized to foster collaboration among global and local stakeholders. Experts recommended a balanced focus on both technical and soft skills development to effectively leverage AI in support of regional geospatial initiatives.

This discussion highlighted the potential and persistent challenges of advancing AI within the geospatial contexts, particularly in promoting sustainable development and regional planning.

8. International Symposium on Leadership Development of Global Geospatial Knowledge

The symposium was dedicated to promoting global geospatial knowledge and strengthening leadership within the sector. Held on United Nations Day (24 October), the event underscored the vital role of geospatial knowledge in advancing sustainable development and fostering international cooperation. The symposium considered:

1) *Regional and National Perspectives* addressed approaches for harmonizing local priorities with global geospatial policies.
2) *Academic and Youth Perspectives* focused on empowering young professionals and enhancing academic engagement in applied geospatial research.
3) *Female Leadership Perspectives* highlighted the distinct challenges and invaluable contributions of women within the geospatial domain.

The session concluded with a focus on capacity development in geospatial leadership, strengthening international partnerships and developing innovative tools to enhance governance. In his closing remarks, Mr. Pengde Li, Head of the UN-GGKIC, reiterated the importance of skill development, knowledge exchange and leveraging strategic opportunities to advance sustainable global progress.

This symposium underscored the expanding significance of geospatial knowledge in global governance advancement and sustainable development, highlighting the transformative potential of cross-sectoral and cross-national collaboration in addressing shared global challenges.

9. Think Tank Initiatives

According to the Pact for the Future, there is a need to apply geospatial knowledge for the accelerating the implementation of the 2030 Agenda for Sustainable Development and post-2030 agenda. The Moganshan Talks played the role to foster dialogue and share knowledge and experiences. From the panel discussions, considerations and recommendations for think tanks are summarized as follows:

1) *Define a Clear Mandate and Structure:* Think tanks should operate with a clear directions and structured approaches supporting established entities and designated leadership roles. Leadership should be proactive, committed and aligned with the think tank's mission. Additionally, collaboration on key topics with established entities, such as the United Nations system or other international organizations, can reinforce credibility and legitimacy.
2) *Establish a Sustainable Operational Framework:* Achieving long-term impact requires a resilient operational model, supported by sustainable funding sources. Consider diversifying funding channels, such as government support, partnerships with the private sector and donations, to secure consistent resources.
3) *Promote Multi-Disciplinary and International Partnerships:* Encourage cross-sectoral and international collaboration, involving experts from diverse fields. Such partnerships enhance research relevance and foster adaptability across regions, thereby supporting global applications.
4) *Prioritize Applied Research and Knowledge Dissemination:* Research outputs should focus on practical applications in areas such as emergency response, policy formulation and public awareness. Disseminating good practices, case studies and guidelines strengthen global knowledge-sharing networks.
5) *Develop Standards and Protocols:* Establishing data collection, analysis and application standards facilitates effective cooperation and enables data interoperability across borders and institutions.
6) *Engage Stakeholders Through Continuous Dialogue:* Ongoing engagement with stakeholders—governments, private sectors, academic institutions and civil society—is essential to align research outcomes with real-world needs and to promote solutions that are inclusive and accessible.
7) *Implement Capacity development and Training Initiatives:* Think tanks should partner with educational institutions to deliver training programs that strengthen local capacities, nurturing skilled professionals.
8) *Consider Establishing a Physical Hub:* A dedicated physical center can serve as a central venue for collaboration, training and research activities, enhancing visibility, accountability and operational efficiency.

These foundational recommendations aim to create think tanks that are impactful and capable of advancing knowledge while addressing global challenges in geospatial information management.

10. Closing Ceremony

In his closing remarks, the Head of the UN-GGKIC expressed his appreciation to international and local participants, co-hosts and supporting institutions. He noted the successful conduct and attendance of the

event, over 700 participants from more than 40 countries, and acknowledged the support of the Government of China and the Deqing County.

From the Moganshan Talks, considerations and ideas included:

1) *Advancement of Geospatial Knowledge:*
    o Prioritize innovation in spatio-temporal technologies to strengthen the digital economy.
    o Align initiatives with the United Nations Integrated Geospatial Information Framework (UN-IGIF) to enhance productivity and evidence-based decision-making.
2) *Promotion of Cross-Border Integration:*
    o Expand international cooperation to foster a resilient and inclusive global geospatial ecosystem.
    o Address data-sharing challenges, particularly for developing countries, in support of the SDGs and the Paris Agreement.
3) *Enhancement of national Digital Infrastructure:*
    o Establish platform for geospatial data sharing, enabling improved coordination and closing data gaps.
4) *Capacity-Building for Youth Leadership*:
    o Invest in the development of emerging geospatial leaders through targeted educational programs and collaborative initiatives, with a focus on fostering talent from developing countries.

Mr. Li invited participants to join the think tank aimed at mobilizing expertise from United Nations system, international academic institutions, private sector entities and government bodies. The think tank session seeks to advance considerations on the strategic pathways of UN-IGIF to support ideas to produce geospatial policy briefs for critical sectors such as agriculture, water resources, biodiversity, etc., promoting the deployment of geospatial solutions across diverse fields.

In concluding, the Head of the UN-GGKIC celebrated the contributions, ideas and fruitful discussions during the week and called on participants to transform these priorities into practical actions, underscoring the importance of ongoing collaboration and innovation to leverage geospatial technologies for enhancing the use of global sustainable development.

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