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Item 3 of the provisional agenda**Capacity-building and international knowledge sharing****Outcome of the thematic webinars on land administration****Note by the Bureau of the Working Party***Summary*

The land administration sector needs to keep abreast of influencing megatrends and domain-specific drivers, and their implications for ensuring fit-for-purpose land administration, effective land use management and increased contribution to the implementation of the 2030 Agenda for Sustainable Development. To this end, the Bureau of the Working Party on Land Administration (WPLA), in collaboration with development partners, organized a series of thematic webinars in 2022 to ascertain how these megatrends are shaping land administration in the region of the United Nations Economic Commission for Europe (ECE).

The webinars drew on WPLA studies on “Digital transformation and land administration – Sustainable practices from the UNECE region and beyond” (2022), developed jointly with the Food and Agriculture Organization of the United Nations (FAO) and the International Federation of Surveyors; and the “Scenario study on future land administration in the UNECE Region” (2021).¹

This document contains the key messages emerging from the thematic webinars. It was prepared by the Bureau with the support of the secretariat. The Working Party is invited to take note of the information provided.

I. Introduction

1. The period since 2020 saw land administration authorities in the ECE region faced with complex challenges in light of the COVID-19 pandemic. Those challenges were amplified by the persisting megatrends, including urbanization and climate change. At the same time, advancements in information and communications technology, digital transformation initiatives and data revolution provided new opportunities. To ascertain how

¹ Available at <https://unece.org/publications/oes/welcome>



these change agents, taken together, are shaping land administration and management in the ECE region, the Bureau of the Working Party organized five thematic webinars over the course of February-June 2022 in collaboration with its partners.

2. The webinars focused on gaining an understanding of how land administration authorities in the ECE region were addressing the challenges and capitalizing on the opportunities to meet the emerging needs in land administration. They facilitated the exchange of experiences, involving the participation of around 400 experts as well as representatives from land administration authorities and relevant agencies in the ECE region and beyond.

3. The webinars highlighted the resilience of national land administration systems in the ECE region in face of emerging challenges. They showed how quick land administration authorities were to rethink their strategies and processes, and many were considering adopting or were implementing innovative solutions. However, as shown in the next section, in some countries, the ability of land administration authorities to bring their forward-looking visions and plans to fruition remained undermined by the lack of human and financial resources.

4. While this constraint is consistent with the reductions in public investments in the face of the COVID-19-induced economic crisis, it also reflects a limited understanding, particularly among decision makers, of the contribution of land administration authorities to achieving the United Nations Sustainable Development Goals (SDGs).

II. Key messages emerging from the webinars

A. Cadastral mapping and strategies of land administration authorities in Europe

5. This webinar discussed the prevailing approaches of the land administration authorities in the ECE region to cadastral mapping and their strategy development, with a view to delineating the future directions of land administration in the ECE region.² It also showcased successful evidence-based approaches to strategy development by the National Land Survey (NLS) of Finland and the Cadastre, Land Registry and Mapping Agency (Kadaster) of the Netherlands.

6. A representative of the Aalto University (Finland) presented at the webinar outcomes of the online survey, which was addressed to mapping, cadastral and land registry organizations across Europe to gain insights into their strategy-development processes and goals. The survey, which was conducted by the NLS in collaboration with the University of Aalto, included responses from 18 organizations across the ECE region and was completed in 2021.

7. The NLS and the Kadaster presented their experiences in the national strategy development and implementation. The NLS explained how the organization used its survey-based approach for the strategy development. The presentation by Kadaster was focused on the strategy implementation and demonstrated how an organizational transformation from “traditional” to “data-driven” generates the required data for informing the decisions of Kadaster clients.

1. Strategy drivers

8. The results of the NLS and Aalto University regional assessment study revealed that land administration strategies are driven by the following factors:

- Policy changes;
- Shifts in customer needs and expectations, which have become increasingly demanding in light of digitalization;

² <https://unece.org/info/Housing-and-Land-Management/events/364529>

- Changes in the responsibilities of the authorities and the resulting need to review internal practices and processes;
- Changes in the budget of the organization and access to external funding sources;
- Anticipated changes in the business environment;
- Recommendations from international organizations;
- The strategic vision of the organization.

9. In terms of strategic orientation, the study showed that national mapping, cadastral and land registry organizations across Europe are focused on, among others:

- Digitalization, understood as adaptation of digital processes (with digitization, i.e. the sole data conversion of analogue to digital data, considered already completed);
- The development of online geospatial digital solutions and systems for ensuring prompt response to emerging needs;
- Improving the quality, quantity, accessibility and security of data and services;
- Response to clients' needs and the society's expectations;
- Organizational development.

10. During the webinar discussion, participants emphasized the strong influence of megatrends in shaping the strategies of land administration authorities. Most notable among these trends are urbanization, climate change, technology advancement, cybersecurity, migration and new ecosystems of collaboration. The COVID-19 pandemic was singled out as another major strategy driver over the past two years, with lockdown measures prompting the authorities to accelerate the digitalization of their processes and management systems.

11. Further, the participants noted that online geospatial solutions enabled land administration authorities to effectively contribute to national COVID-19 response strategies, which required interactive analysis to identify the immediate needs and effects of the pandemic on frontline responders, communities and society. Whether governments were assessing community risk, measuring the effectiveness of social distancing policies, managing supply chains, or communicating with the public, location was key.

2. Approaches to cadastral mapping and strategy development

12. NLS and Kadaster follow an evidence-based approach to cadastral mapping and strategy development. The two organizations carried out extensive consultations through workshops and cross-departmental working groups, in order to validate the collected information and solicit feedback on the different elements of their strategies.

13. The findings emerging from the NLS and Aalto University regional assessment show that successful strategy development and its implementation are influenced by the following factors:

- The efficiency and effectiveness of the strategy development process, something which requires enough time, the involvement of the whole organization and the use of outside professionals.
- Learning from previous experiences - strategy processes are most often improved by learning from previous processes; and previously implemented successful strategies provide an important source of inspiration.
- Translating strategies into practice requires continuous communication, capacity building and systemic data collection for the purpose of monitoring and evaluation. This can be achieved through:
 - Organization of strategy days, seminars, workshops; publishing newsletters to communicate strategy goals and elements across the organization;
 - Use of key performance indicators, conducting customer surveys and personnel surveys were used to monitor strategy implementation;

- Regular monitoring of the implementation. It was noted that only 53 per cent of the organizations monitored the changes resulting from strategy implementation.

14. The experience of Kadaster highlights the following factors as prerequisites for successful strategy development and implementation.

- Existence of well-established, trusted and operational cadasters and land registry systems. A focus on upscaling the use of spatial data,
- Shifting from supply to demand and purpose-driven approaches to strategy development,
- Shifting from process-centric to data-centric management information systems based on clearly articulated principles:
 - Use of same language/semantics;
 - Separating responsibilities for data and processes;
 - Ensuring safe and secure handling of data;
 - Insight in own and personal data;
 - Regular training of employees to ensure they are qualified and handle the data in a responsible way;
 - Use of proven standards;
 - Storing data only once;
 - Use data from the source;
 - Publishing the data as open data (the data which are possible to publish openly).
- Placing data at the centre of the organization's daily activities through:
 - Establishing institutionalized mechanisms for supporting cooperation across divisions;
 - Ensuring clear roles and responsibilities for data collection, maintenance and dissemination (primary and support);
 - Alignment of strategic, tactical and operational objectives related to the data.

B. Geospatial information – advanced education and competence needs

15. Organized jointly with the University of Gavle, Sweden, and the Food and Agriculture Organization of the United Nations,³ this webinar discussed the alignment of higher education with the competency needs of public and private sector organizations engaged in the geospatial industry. It saw the participation of representatives from land administration authorities and private sector organizations involved in developing of geographic information systems (GIS) and land development projects, who shared the industry's emerging competency needs considering the continued advancements in information and communication technologies and the increased complexity of global challenges. The webinar also involved interactive polls geared towards soliciting the views of participants and facilitating experience sharing. Results of the interactive poll and discussion are presented below.

16. At the webinar, participants highlighted the acute shortage of skills for modern geospatial information management. This is especially important, since required competencies are often interdisciplinary in nature, covering traditional geospatial information, GIS, ICT architecture and systems development, artificial information programming, data management and business administration.

³ <https://unece.org/info/Housing-and-Land-Management/events/364956>.

1. Results of the webinar interactive poll on skills shortage

17. Participants were asked to highlight major thematic areas of relevance to their organizations as well as their views on the contribution of universities to addressing skills shortages in their respective countries.

18. The interactive poll showed the following key thematic areas of studies at universities related to geospatial information most relevant to the work of national land administration authorities:

- GIS and information science;
- ICT systems development;
- Modern digital solutions (e.g., artificial information, Big Data and the Internet of things);
- Geodesy and geodetic infrastructure;
- Programming and application development;
- Photogrammetry, laser scanning and remote sensing.

19. The interactive poll also showed that regarding the number of students at bachelor, master and PhD level, corresponds to the actual competence needs by only 60, 55 and 52 per cent respectively. Moreover, the alignment of the contents of the educational programmes for the three levels (bachelor, master and PhD) only corresponded to 61, 63 and 58 per cent, respectively of the competence needs.

2. Addressing the skills shortage

20. Participants were of the view that universities should raise the promotion of geospatial information related studies to high school students. Asked about the strategic aspects that universities could spotlight to attract students, participants highlighted the importance of geospatial knowledge for addressing today's global challenges, including climate change and urbanization. Participants also drew attention to the fact that the youth are not familiar with the notion of "geospatial" information even though they use geospatial mobile applications daily. The need to further develop this notion in a manner that speaks to the youth cannot be overemphasized, as well as the notion of maps, since the youth prefer using interactive maps. Table 1 shows the strategic aspects of geospatial information related studies identified by the participants, ranked from 1 to 10, with 10 being the highest score.

Table 1. Geospatial information related studies: strategic elements for attracting high school students

<i>Themes</i>	<i>Score out of 10</i>
Use of new ICT systems and solutions	8.8
Contribution to innovation (products and services)	8.5
The notion of "maps"	8.1
Contribution to sustainable development	7.6
Programming and application development	7.3
The notion of "geospatial" information	6.9
GIS and information science	6.8
The notions "land surveying" and "geodesy"	6

Source: UNECE

21. Furthermore, participants noted that universities should upscale collaboration with the private sector through, for example, joint projects linked to addressing immediate and long-term national and global social, economic and environmental challenges. They also

emphasized the importance of virtual and hybrid continuing professional development (CPD) for enabling geospatial experts to keep pace with new ICT systems and solutions, theories and best practices. There was also a consensus among participants on the need to bring the geospatial industry's skills shortage problem to the global level, including through focused workshops that could build on the webinar's discussions.

C. Benefit and challenges of open data in land administration

22. The UNECE Working Party on Land Administration, jointly with the *Colegio de Registradores de la Propiedad, Mercantiles y de Bienes Muebles de España* (Spain) organized this webinar on the benefits and challenges of open data policies.⁴ Building on the analysis and conclusions of the UNECE WPLA report on [Scenario Study on Future Land Administration in the UNECE Region](#), this webinar participants further discussed to what extent land registry information should be made open, considering aspects such as the complexity of the information, the protection of personal data and the risk for fraud. The presentations discussed different perspectives including examples from the UNECE region.

23. The webinar participants highlighted that open data policies are essential for supporting sustainable development, solving societal challenges and enabling innovation. However, it is important to strike a balance between the principle of public access to the data and concerns over data protection and illicit activities. Therefore, it is necessary to articulate mechanisms that prevent fraud and guarantee adequate protection of personal data with open data. The participants underlined the experiences of land administration authorities in countries of the European Union (EU) in developing personal data protection measures as the EU has established very strict rules for personal data protection.⁴

1. Different approaches to the provision of data

24. Participants noted that concerns over the data protection are raising fears of excessive openness of the data, thereby rendering a situation whereby accessibility to the data maintained by the land registries is inherently restricted. In this connection, the experience of the EU, where public access to the data is governed by EU personal information protection rules as well as by national laws which are different from one country to another, there are different approaches to addressing these concerns. These approaches of different EU member countries could be divided into two broad categories:

- Access is granted based on proof of legitimate interest;
- Open access is provided only to basic information. Access to other information is provided when a legitimate interest is demonstrated.

25. The point was made that EU member countries differ in their approach regarding access to the data; the approach is shaped by the social and cultural contexts of individual countries and reflected in the judicial traditions. For example, Spanish legislation defines the purpose of land registries as providers of a public service to ensure legal certainty in the real estate market in terms of property rights and the rights of third parties. To achieve these objectives, land registries in Spain provide open access to the data, which is verified by the land registrars through their function of controlling the legality of all the transactions.

26. The data maintained by the land registries is of great value for the economy, e.g., for start-ups, existing businesses, for utility services; this highlights the added value and trustworthiness of land registries. Ensuring the reliability of the data is a key element for further developing the Spanish land registers and cadastres, with a view to increasing their contribution to the achievement of the SDGs.

⁴ See the European Convention on Human Rights, article 8 at: <https://eur-lex.europa.eu/EN/legal-content/glossary/european-convention-on-human-rights-echr.html>; and the EU Charter of Fundamental Rights, article 8 at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012P/TXT>.

2. Benefits and challenges of open data in land administration

27. The issues surrounding using open data for improving public access to land registries were presented by the Land Portal Foundation, which is a Dutch public benefit organization specialized in creating, curating and disseminating land governance information through linked and open data technologies. Driving these services is the Open Data Charter, which was launched in 2015 and involved over 150 governments and experts committed to sharing data on land use as of April 2022. The success of the Open Data Charter is attributed to its emphasis on:

- Data and people interoperability;
- Guidance for multi stakeholder discussions;
- Work with users throughout the development of open data platforms to ensure constant feedback;
- Data assessments for addressing and managing expectations;
- Data creation and documentation for ensuing high quality;
- Open data as a means for promoting informed participation;
- Development of application programming interfaces (APIs) for promoting the re-use of data;
- Allocation of resources for monitoring progress.

28. Participants emphasized that using open data generates immediate benefits in the form of improved transparency and business predictability. Using open data also contributes to digital transformation, since it involves the development of modern digital solutions that are useful for other sectors. The challenge relates to arriving at a national consensus among regulators, land administration authorities and users on the type of information that should be open to the public, the aspects that should be subjected to access restrictions and on instances where increasing accessibility contradicts national data protection laws.

29. Participants were of the view that addressing such challenges requires strengthening the institutional framework for curbing illicit transactions in the real estate market, particularly money laundering, which is a major concern in EU countries as emphasized in the European Parliament briefing “Understanding money laundering through real estate transactions”.⁵ In this regard, the experience of Spain was presented as an example to follow.

30. The Government has been developing a comprehensive system that links the different authorities using a range of coordination mechanisms and technologies for curbing and pre-empting real estate fraud, the misuse of electronic land registration and money laundering. Land registries are a key element in this system and cooperate with other institutions, especially through the Center for the Prevention of Money Laundering.

D. Socioeconomic benefits of geospatial information

31. Organized jointly with the Norwegian Mapping Authority and the FAO, this webinar discussed the socioeconomic benefits of geospatial information.⁶ The discussions drew on the experience gained from Norwegian funded projects for supporting the implementation of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) Integrated Geospatial Information Framework (IGIF).

32. The webinar involved an overview of internationally recognized tools for assessing the socioeconomic impact of major investments in geospatial information systems at the national level. It also involved presentations by national land administration authorities and international experts, who shared the experiences of Georgia, Kyrgyzstan, the Republic of Moldova and Ukraine in developing integrated geospatial information systems.

⁵ https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI%282019%29633154

⁶ <https://unece.org/info/Housing-and-Land-Management/events/367024>

1. On the importance of geospatial information

33. Participants emphasized the critical importance of geospatial information for evidence-based decision-making. They noted the wealth of data contained in geospatial information, which enables the optimal planning of basic infrastructure and utility services at the national and local levels, including roads, rail, ports, utilities and community services such as education, health, welfare and justice. By enabling optimal planning, geospatial information supports, among other things, poverty alleviation, environmental protection, transparency and regional integration. Participants noted that developing integrated, whole-of-government, geospatial information systems translate into immediate benefits, including, among other things:

- A solid basis for aligning national geospatial information systems with EU harmonized standards and norms as well as international standards and best practices;
- An impetus for furthering digital transformation;
- Strengthened land tenure security;
- Shortened disaster response times;
- Improved land use planning and land management systems.

2. Barriers to exploiting geospatial information to its full potential

34. Participants noted that many countries do not have adequate national spatial data infrastructures (SDIs), with policy makers having limited understanding of the potential contribution of this highly technical and expensive system to national development efforts. An issue is not only the technical specifications of national SDIs, but also the “use cases”, i.e., examples of practical applications of geospatial information systems.

35. This lack of practical examples understandable for the policy makers has meant that the development of national SDIs continues to rank low on national development agendas. At the same time, donor agencies are faced with competing demands. Since 2020, the COVID-19 pandemic has accentuated this trend, as it shifted the focus of many donor agencies to addressing the emergency health, safety and economic needs of their beneficiary countries.

3. Evidence-based tools for assessing the socioeconomic benefits of geospatial information

36. A running theme throughout the webinar was the lack of resources for financing SDI development. Participants noted that geospatial enhancements rarely justify launching projects. Successful experiences show that mobilizing resources requires concrete evidence to convince decision makers and donors. This means consistent efforts to develop the “use cases” at the national and sub-national levels, particularly in cities, which tend to have greater flexibility, so that such cases are developed more quickly.

37. Participants emphasized that the IGIF provides a strong basis and guide for developing, integrating, strengthening and maximizing geospatial information management and related resources. They also noted that reaping the expected benefits requires aligning the framework with national strategies and arrangements, so that it can be anchored in national development priorities.

38. In this regard, the World Bank IGIF 4-step methodology for country level implementation was highlighted as a useful guide. It provides templates and tools for a thorough socioeconomic impact assessment of potential projects, starting with a baseline assessment using the World Bank IGIF Diagnostic Tool; continuing with the Alignment to Policy Drivers; following with a Socio-economic Impact Assessment and concluding with Action and Investment Plans. Land administration authorities could also use targeted tools for the socioeconomic impact assessments, such as Green Growth Use Cases, Cost Benefit Analysis and Generic Process Description.

39. National agencies should work with their governments to link IGIF action plan initiatives with larger projects. Successful experiences show that socioeconomic impact assessments should:

- Be standards-based, so as to ensure a consistent approach at the national and sub-national levels and allow for tracking progress in developing national SDIs;
- Identify qualitative and quantitative (financial) benefits;
- Provide quantified benefits for a variety of use cases across numerous economic sectors.

40. In terms of benefits, representatives of national land administration authorities noted that the impact assessments enabled them to develop:

- An accurate understanding of the national and local physical and environmental contexts;
- A concrete vision with a detailed action plan, which unites the different departments of land administration authorities and facilitates cooperation with relevant agencies.

4. Takeaways from successful spatial data infrastructures development experiences

41. Participants cited the following factors for ensuring the sustainability of SDI development efforts:

- Building sustainability into projects from the outset;
- The importance of establishing efficient communication channels for sustainability;
- The importance of local knowledge for adapting to the local context;
- Including defense and security as key use cases;
- Using national statistics and financial indicators to rally national support and donors;
- Providing users with the data to increase the opportunity to improve and add value to geospatial information.

E. Data interoperability: The benefits for the Land Administration sector

42. This webinar focused on the internationally recognized data principles of findability, accessibility, interoperability and reusability of data (FAIR),⁷ which emphasize machine-actionability (i.e., the capacity of computational systems to find, access, interoperate and reuse data with none or minimal human intervention).⁸

43. The webinar demonstrated how the public sector can apply the FAIR principles to further develop and improve access to location data, and in so doing, drive innovation, increase productivity and reduce transaction costs. The webinar discussed a case study by His Majesty's Land Registry (HMLR, United Kingdom) on the implementation of the FAIR principles for improving access to geospatial data. It also discussed avenues for accelerating digital transformation in land administration as well the resulting benefits and challenges.

1. FAIR principles as reference framework for facilitating access to geospatial information

44. HMLR shared its experience in developing its online use land and property data service, which enables individuals and businesses (in the country and abroad) to access geospatial data on registered land and property in England and Wales; most of the data can be downloaded for free. The service was developed following the FAIR data object assessment metrics (Table 2), which are also used for tracking progress in improving the service. HMLR is an active solicitor of user feedback, which is used for identifying areas requiring further development. For example, complaints about slow data generation point to

⁷ <https://www.go-fair.org/fair-principles/>

⁸ <https://unece.org/info/events/event/368344>

the need for further developing the Application Programming Interface (API), which allows for integrating disparate systems and data sources into a cohesive whole. In June 2022, HMLR was finalizing its high-level strategy for further improving the interoperability and reusability of its geospatial information.

Table 2. FAIR data object assessment metrics

<i>Principles</i>	<i>Identifies</i>
Findable	<p>Data is assigned a globally unique identifier.</p> <p>Data is assigned a persistent identifier.</p> <p>Metadata includes descriptive core elements (creator, title, data identifier, publisher, publication date, summary and keywords) to support data findability.</p> <p>Metadata includes the identifier of the data it describes.</p> <p>Metadata is offered in such a way that it can be retrieved by machines.</p>
Accessible	<p>Metadata contains access level and access conditions of the data.</p> <p>Metadata is accessible through a standardized communication protocol.</p> <p>Data is accessible through a standardized communication protocol.</p> <p>Metadata remains available, even if the data is no longer available.</p>
Interoperable	<p>Metadata is represented using a formal knowledge representation language.</p> <p>Metadata uses semantic resources.</p> <p>Metadata includes links between the data and its related entities.</p>
Reusable	<p>Metadata specifies the content of the data.</p> <p>Metadata includes license information under which data can be reused.</p> <p>Metadata includes provenance information about data creation or generation.</p> <p>Metadata follows a standard recommended by the target research community of the data.</p> <p>Data is available in a file format recommended by the target research community.</p>

Source: FAIRsFAIR, <https://www.fairsfair.eu/fairsfair-data-object-assessment-metrics>.

2. Digital transformation in land administration

45. One of the impacts of the COVID-19 pandemic has been an acceleration in the demand for online digital services and improved access to geospatial data. As land administration and management authorities seek to address this demand, the difficulties of following the FAIR principles have been brought to the spotlight. Participants noted that in many countries, government agencies tend to adopt or create their own standards for recording, managing, using and sharing data, which undermine data exchange and reuse.

46. The findings emerging from the ECE joint publication with FAO and the International Federation of Surveyors (FIG) “Digital Transformation and Land Administration: Sustainable Practices from the UNECE Region and Beyond”, show that in many countries

the pandemic provided a new impetus for accelerating digital transformation in land administration. These land administration authorities exhibit the following characteristics:

- **Intelligent:** All relevant property rights, restrictions, and responsibilities digitalized with real-time registration of transactions, data-driven decision-making, and efficient service provision;
- **Interoperable:** Developed online systems for production, dissemination and visualization of diverse land tenure datasets. Data relating to above and below ground, water and marine environments, built environments, building information modelling, natural environments, land use planning, land valuation and taxation, and land development are linked. Key registers and data standards ensure the interoperability of the systems of government agencies and private agents (e.g., real estate agents, notaries or surveyors);
- **Inclusive:** Women and vulnerable groups participate and access geospatial information services. The systems document and secure all types of tenure – customary, freehold, leasehold, occupancy or common properties. They also address the digital divide between and within countries, urban and rural, and men and women, through enabling policies and technological environments;
- **Interactive:** online systems are accessible and easy to operate and navigate, with the necessary security controls, including use of digital identities and e-signatures;
- **Incorporated:** The land administration authorities build ecosystems for supporting cooperation, partnerships, and multisectoral participation, thus achieving greater coherence and commitment by stakeholders and decision makers;
- **Investments are based on sustainable business models, which balance the costs of implementation and maintenance with affordable service provision.**

III. Concluding remarks

47. The webinars demonstrated the importance of accelerating digital transformation in land administration as a key requisite for unlocking the full potential of land. Geospatial and land information is a key source for open data. It provides a comprehensive digital profile for each property, thereby enabling individuals and governments to make informed decisions and act based on the same information.

48. Participants emphasized that short-term, ad hoc, modest, digital transformations do not work. Geospatial information uses a variety of data sources, which makes establishing interoperability solutions with harmonized standards and licensing very complex. At issue is not only the lack of expertise, but also the lack of funds, with governments and donors failing to grasp the fundamental role of land administration authorities in ensuring the successful implementation of the 2030 Agenda for Sustainable Development.

49. Many land administration authorities are seeking to automate their information systems and services. While the journey of each land administration authority is unique, there is much room for mutual learning and experience sharing. FAIR principles provide a useful set of benchmarks. None the less, they can be ambiguous and, unfortunately, there is no one-size-fits-all solution.

50. It is, therefore, important to discuss the different challenges facing land administration authorities and how they are viewing and approaching FAIR Principles and the issues surrounding the right to data. Furthermore, decision makers in land administration should base their digital transformation plans on comprehensive socioeconomic impact assessments and develop scenarios for addressing emerging megatrends. Above all, more needs to be done to place the consolidation of fit-for-purpose land administration authorities high on the agenda of governments and donor agencies.