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A CALL TO ACTION:
Climate Responsible Land Governance and Disaster Resilience:
Safeguarding Land Rights

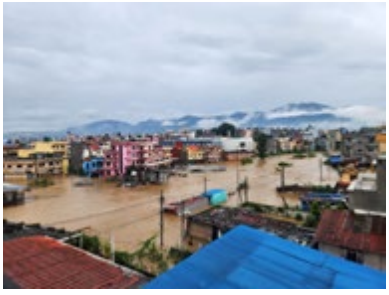

FIG REGIONAL CONFERENCE 2024 IN NEPAL

NICS

INTERNATIONAL FEDERATION
OF SURVEYORS (FIG)

A CALL TO ACTION:
Climate Responsible Land Governance and Disaster Resilience: Safeguarding Land Rights

FIG REGIONAL CONFERENCE 2024 IN NEPAL

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Left: Flash Flood in Kathmandu. (Photo-Nakul Shrestha)
Middle: FIG President Dr. Diane Dumashie handing over the Call-to-Action document to Mr. Ganesh Prasad Bhatta, officiating Secretary of the Ministry of Land Management, Cooperatives and Poverty Alleviation.
Right: Earthquake in Jajarjot, Nepal. (Photo Geovation Nepal-Shishir Lamsal)

Back cover photo: Mt. Everest World's Highest Peak. © Nepal Tourism Board

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FOREWORD BY FIG PRESIDENT DIANE DUMASHIE

This FIG Nepal CALL TO ACTION on Climate Responsible Land Governance and Disaster Resilience underscores the imperative for land professionals to act in a climate responsive way. The publication is an outcome of the deliberations at the FIG Regional Conference in Katmandu, Nepal, November 2024. It highlights that Climate Change has a huge impact on vulnerable populations and landscapes, such as in the mountainous regions of Nepal.

The publication presents the conference purpose and the emerging global to local cooperative efforts seen within our survey community. It is a milestone FIG document on Climate Action demonstrating our purposeful articulation and contribution to the greatest challenge we face as land professionals.

Climate action is a key focus of the FIG Work Plan 2023–2026 and the FIG Vision to 'serve and leave no-one behind.' It is not enough to be sustainable … we need to also be resilient. As a profession we need to act together to generate knowledge and climate resilient land for people and the planet. For this reason, we created the FIG Climate Compass Task Force to steer us and chart our way forward. With support from all FIG Commissions, we increase our knowledge, skills and tools to adapt and mitigate climate change.

This CALL TO ACTION, as agreed at the conference, includes practical strategies for all land professionals to address climate change and provide disaster resilience. A significant outcome of the conference was the creation of a collaborative Asia regional partnership linked to the CALL TO ACTION. In this regard some resolutions focused on bridging regional gaps in practical knowledge, capacity implementation, resources and coordination.

Surveyors are a crucial bridge between environmental policy and practice. This will be best achieved by informing and working with partners. We need government led solutions which go to scale. The industry work force needs to be scaled up and young surveyors are the key to our role as a profession delivering solutions. We can innovate with new technology that facilitates scenario development on climate change and action to guide decision makers. We can demonstrate how important it is to integrate climate geospatial data, including geo-earth observations, with land administration systems. All this work must be shaped by our professional ethics and standards. We must work collaboratively and in partnership with climate stakeholders and other experts. Land rights must be safeguarded, including the rights of vulnerable people while, at the same time, supporting adaptation and mitigation measures.

We acknowledge those who made this conference a success through the power of partnerships. This includes the Nepal Institution of Chartered Surveyors and Nepal's Ministry of Land Management, Cooperatives and Poverty Alleviation. We strongly recognise the role of Ganesh Prasad Bhatta, Joint Secretary of the Ministry, who was ably supported by a large local team, including Tina Baidar and Sanjeevan Shrestha, and many more too numerous to name. Thanks also goes to FIG global partners from the World Bank, supporting the conference with a multiple session programme, and to the support and contributions of UN-Habitat/Global Land Tool Network, as well as ideas

and programme input from Kadaster International. Our grateful thanks for the efforts of Dr. Clarissa Augustinus, Co-chair of the Climate Compass Task Force, as the lead author and coordinator for this publication.

It is our hope that this CALL TO ACTION will resonate and inform the FIG global community, and that the knowledge will be widely applied throughout the world and especially in vulnerable countries. The future we want supports the United Nations SDG global agenda. It is about 'People' – the responsible governance of tenure; 'Partnerships' – global to local; 'Peace' – human rights and equity; our 'Planet' – addressing the impact of climate change and natural disaster; and 'Prosperity' – economic growth, livelihoods, jobs, land and property.

Through the work of the organising team, the unwavering support of our global partners and the knowledge sharing, and openness to new ideas from our delegates, we successfully held an Asian regional conference on climate producing this publication and a CALL TO ACTION.

Diane A Dumashie,
FIG President (2023–2026)

FOREWORD BY CO-CONFERENCE DIRECTOR GANESH PRASAD BHATTA

It is with great pride and heartfelt gratitude that we present this publication, a remarkable outcome of the successful FIG Regional Conference 2024 held in Kathmandu, Nepal. This event, hosted by the Nepal Institution of Chartered Surveyors (NICS), under the prestigious banner of the International Federation of Surveyors (FIG), marked a pivotal milestone for our country and the region. The realisation of such a large-scale event has been a long-cherished dream, reflecting our collective determination and collaboration.

The theme of the conference, 'Climate-Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights,' was chosen with the aim of addressing some of the most urgent challenges we face today. Climate change and natural disasters pose significant threats to land rights and societal resilience. This publication encapsulates the knowledge, insights, and innovative solutions shared during the conference, aiming to promote climate-responsive land governance and inspire actions that foster resilient communities. We are confident that the contributions compiled here resonate that vision and provide valuable guidance for advancing these critical objectives.

This publication stands as a testament to the meaningful partnerships and collaborations fostered during the conference. Over 280 participants from more than 30 countries – including national and regional institutions, academics, professionals, governments, development partners, NGOs, non-state actors, and private sector representatives – came together to exchange knowledge, ignite dialogue, and facilitate technology transfer. The conclusion of the event with a CALL TO ACTION was a powerful outcome intended to guide government agencies, professional organisations, and stakeholders in aligning their efforts with the conference's objectives.

As we reflect on the success of this event, we are reminded of the Nepali principle of "Atithi Devo Bhava" or "The Guest is God." We endeavoured to extend our warmest hospitality to all participants and hope that the vibrant culture, rich history, and natural beauty of Kathmandu left a lasting impression. For our Nepali attendees, we trust this event provided invaluable opportunities to expand professional networks and gain fresh perspectives on the pressing issues at hand.

We extend our deepest gratitude to FIG for entrusting us with the opportunity to host this conference in Nepal. We are equally thankful to our co-organisers, partners, sponsors, esteemed speakers, and distinguished participants for their generous support and contributions, which made this event possible. Most importantly, I would like to take this opportunity to extend heartiest thankfulness to some of the imminent personalities for their support including Mr. Tirtha Bahadur Pradhanang, the President of NICS, for trusting me to lead the local organising committee. I also want to thank Dr. Diane Dumashie, the President of FIG for her visionary leadership and inspiring contributions, and my counterpart Ms. Louise Friis-Hansen, the FIG Director and Co-conference Director for her hard work and guidance throughout successful completion of the event. Dr. Clarissa Augustinus, who extraordinarily contributed to the success of the event, by leading the publication and technical aspects. Ms. Paula Dijkstra, the Director of Kadaster International, for her instrumental role in shaping this event despite being unable to attend the event in person. Mr. Janak Raj Joshi, the Executive Director of the Land Management Training Center, for hosting the pre-event of the Young Surveyors' meeting. Ms. Tina Baidar and Mr. Sanjeevan Shrestha for their tireless efforts during the event, and all those who have contributed in one way or another. This event would not have been successful without the continued support and encouragement of the Government of Nepal, particularly the Ministry of Land Management, Cooperatives, and Poverty Alleviation, under the distinguished leadership of Honourable Minister Mr. Bala Ram Adhikari and Secretary Mr. Arjun Prasad Pokharel. I extend my highest regards and sincere appreciation to them.

This publication is more than a record of the event, it is a resource for continued learning and a CALL TO ACTION. We hope it serves as an enduring source of inspiration for advancing climate-responsive land governance and building resilient communities. May it inspire innovative ideas, enduring partnerships, and meaningful progress in the years to come.

Ganesh Prasad Bhatta
Chair, LOC / Co-Conference Director / FIG Representative-NICS

EXECUTIVE SUMMARY

This International Federation of Surveyors (FIG) Regional Conference on 'Climate responsive land governance and disaster resilience: safeguarding land rights,' focused on South Asia, was held in Kathmandu, Nepal from the 14–16 November 2024. The conference was hosted by the Nepal Institution of Chartered Surveyors (NICS), the sole member association of FIG from Nepal. The World Bank was a key partner organisation in the conference. As part of the conference a workshop on 'Land Use Planning in Nepal: Opportunities, Challenges, and Prospects' was organised by the World Bank in partnership with the Ministry of Land Management, Cooperatives and Poverty Alleviation (MLMCPA) and FIG.

The conference addressed the most challenging issue of our time, the climate crisis which is affecting all the countries in the region. Because of the importance of climate change to the global community, FIG decided to examine and actively promote the engagement and role that surveyors can have in contributing to the climate change agenda. The conference was a major milestone in achieving the FIG vision on rethinking the way climate challenges are addressed, thus enabling FIG to support the achievement of the 2030 Sustainable Development Goals (SDG) Agenda. Climate underpins the FIG Council's vision of sustainability over the term 2023–2026. The conference demonstrated that the expertise of surveyors means they are well positioned to make a major contribution to addressing a wide range of climate change issues.

The Conference provided an opportunity for networking, learning, providing practical knowledge and actionable recommendations about how surveyors and land practitioners can address climate and disaster in the region, also for vulnerable populations. This was done through a focus on 4 thematic areas: 1) Climate responsive land governance; 2) Natural disaster resilience for communities, professionals and organisations; 3) Cooperation and partnerships to safeguard land rights; and 4) Capacity development for communities, professionals and organisations. Three thought provoking inaugural and plenary sessions and numerous technical sessions provided an opportunity to present and reflect on good practices, lessons learnt and shared experiences on the critical role of surveyors and land practitioners in addressing the pressing challenges of climate change.

The conference achieved its two main objectives. The main objective was to build knowledge and capacity in the region to address climate change and disaster-induced challenges in safeguarding land rights of vulnerable groups, emphasising the critical role of land governance and resilience. The second objective was to foster collaborative partnerships among national and regional institutions, academics, and professionals to facilitate knowledge sharing and technology transfer at the regional level, and to build FIG's presence in the region. Integral to these objectives was the adoption of a CALL TO ACTION. This was based on the innovative regional and national thinking presented at the conference, including a range of pioneering actions to address climate change and natural disasters. These actions are useful for governments, professionals, academics and NGOs.

THE CALL TO ACTION

To provide actionable insights and tools to address climate change and disaster resilience, emphasising the importance and need of land professionals' expertise in safeguarding land rights.

A CALL TO ACTION was developed during the **International Federation of Surveyors** (FIG) Regional Conference in Kathmandu, Nepal 14–16 November 2024, hosted by the Nepal Institution of Chartered Surveyors (NICS). This CALL TO ACTION provides actionable insights and tools to enhance the role of surveyors, property valuers, and land practitioners in addressing **climate change** and **disaster resilience**. It emphasises the importance and need of expertise in safeguarding land rights, **promoting sustainable land governance**, and **mitigating the impacts of climate change**, with a focus on **equity and inclusivity**.

Climate change is one of the most pressing challenges of our time, with significant implications for land use, property values, and tenure security, particularly for vulnerable and marginalised communities. By addressing these issues, the profession can contribute to achieving global climate goals and the Sustainable Development Goals (SDGs).

Purpose of this CALL TO ACTION are to:

1. Develop and implement climate-resilient land governance practices.
2. Build capacity in using spatial data for climate action and disaster recovery.
3. Advocate for equitable policies and practices that protect land rights.
4. Engage in regional partnerships and knowledge-sharing initiatives.

Key Focus Areas are:

1. **Safeguard Land Rights:** Promote climate responsive land governance frameworks and fit-for-purpose land administration, including secure land tenure, equitable land use planning, transparent land administration and valuation, and coordination across government.
2. **Collaborative Partnerships:** Build regional networks and a partners' platform to share knowledge, technology, and best practices for climate resilience and disaster management, also through supporting the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) frameworks.
3. **Capacity Building:** Enhance technical and professional skills to measure, monitor, and address climate change and natural disasters using innovative technologies and approaches.
4. **Disaster Resilience:** Promote rapid response and recovery mechanisms, including for land administration, valuation, compensation, and transparent land management practices.
5. **Innovative Practices:** Embrace sustainable urban planning, smart cities, and technology-driven approaches to manage land and water resources effectively.
6. **Youth and Equity:** Empower young professionals, women, and marginalised groups to take leadership roles in climate-resilient land governance.

With these priorities, the profession can play a significant role in creating sustainable, climate-resilient communities and ensure just land governance for future generations.

This means aligning the work of land practitioners, land use planners, surveyors, valuers, and other related professionals with climate action.

Pre-events were also held before the conference:

- Workshop on Land Use Planning in Nepal: Opportunities, Challenges, and Prospects which was organised by the World Bank in partnership with the Ministry of Land Management, Cooperatives and Poverty Alleviation (MLMCPA) and FIG.
- 5th FIG Young Surveyors Network Asia and the Pacific Meeting 'Empowered Youth for Climate Resilient Lands.'

There were 286 participants from 30 countries and international, regional, and national sponsors and partners.

CALL TO ACTION
CLIMATE RESPONSIBLE LAND GOVERNANCE AND DISASTER RESILIENCE: SAFEGUARDING LAND RIGHTS

International Federation of Surveyors (FIG) Regional Conference for Asia on 'Climate Responsible Land Governance and Disaster Resilience: Safeguarding Land Rights'
Held in Katmandu, Nepal on 14–16 November 2024

CALL TO ACTION

PREAMBLE

The participants at the FIG Regional Conference held in Nepal on the 14–16 November 2024 in Kathmandu, hosted by the Nepal Institution of Chartered Surveyors (NICS), acknowledged that the climate crisis represents the single greatest challenge facing humankind. We need to ensure that the planet remains sustainable, and our people remain resilient. This theme underpins the FIG Council's vision of sustainability over the term 2023–2026. Because of the importance of climate change to the global community, FIG wishes to examine and actively promote the engagement and role that surveyors, property managers and land practitioners can play in contributing to the climate change agenda. FIG wishes to lead its members so that they can fully understand, articulate, and use their expertise and practical knowledge to tackle the important challenges in climate action, including focusing on the economic impact on the tenure (including ownership) and value of undeveloped and developed land. Noting that climate change affects everyone, but its effect hits the poorest and those without secure land rights the hardest and aggravates existing inequalities, it further increases the levels of exclusion for the marginalised.

This Regional Conference for Asia and CALL TO ACTION is intended to be a major milestone in achieving the FIG vision. The NICS, as an FIG Member Association, has actively worked to support the achievement of this vision and milestone with reference to the Asian region. This Regional Conference discussed a range of climate challenges in the region such as greenhouse gas emissions/carbon, biodiversity loss, deforestation and large-scale land use change, urban sprawl into agricultural land, flooding, landslides, water scarcity, and more, also considering disaster resilience and the safeguarding of the land rights of vulnerable people.

The expertise of FIG Members in the region and the role of surveyors and land practitioners are critical in achieving the climate change agenda and the Sustainable Development Goals (SDGs). Surveyors, property managers, and land practitioners contribute to sustainability through a wide range of activities as evidenced from the CALL TO ACTION below. Young surveyors have a critical role to play in this also because of the uncertain outlook for the Asian region due to climate change and poorly managed natural disasters. Regional cooperation will improve the ability of FIG Members, surveyors, property managers, and land practitioners to achieve humanities climate goals.

This Conference, which is focused on climate action, builds on and takes forward the work of previous FIG conferences, workshops, and publications addressing climate such as:

FIG Christchurch Declaration No. 68 Responding to Climate Change and Tenure Security in Small Island Developing States: The Role of Land Professionals (2016). This Declaration highlighted the United Nations frameworks which should underpin the work of surveyors, such as the FAO Voluntary Guidelines on Responsible Governance of Tenure, Forests and Fisheries (2012). It also identified some of the key elements needed to address climate change such as building climate-resilient land governance, valuation approaches, and capacity development. Regional capacity development and technical coordination, collaboration, and partnerships were identified as key to meeting the climate crisis.

FIG Publication No. 65 The Surveyors' Role in Monitoring, Mitigating, and Adapting to Climate Change, FIG Task Force on Surveyors and Climate Change (2014). This report highlighted the key role surveyors play regarding climate resilience in different sectors such as: urban, including peri-urban areas, rural areas, coastal zones, forest resources, carbon credit markets, large-scale agriculture, water resources, the construction of physical infrastructure, energy and the spread of disease. All these issues are important for the Asian Region and our resolutions need to ensure we can address the climate issues in all these sectors.

FIG Publication No. 55 Spatial Planning in Coastal Regions, Facing the Impact of Climate Change (2010). This report focuses on climate change in coastal zones and highlights the issues of spatial planning, impacts of climate change on coastal zones and sea level rise, coastal zone management, assessment of coastal vulnerability, valuation of coastal resources (including non-market), and coast adaptation, policy processes for coastal adaptation including for wetlands, mangroves, Small Island Developing States and moving coastlines. Again, all these issues are important for the Asian Region and our resolutions need to ensure we can address the climate issues associated with coastal zones.

Key messages

This CALL TO ACTION aims to deliver concrete strategies and actionable recommendations to:

- Strengthen and safeguard land rights for both women and men against climate challenges.
- Foster collaborative partnerships for climate resilience and to bridge gaps.
- Enhance disaster resilience of both people and places through knowledge and capacity.
- Enhance regional responses through best practices and fit-for-purpose standards.
- Strengthen land governance, equitable land decision-making, and empower land practitioners.
- Increase monitoring and measuring for climate action, and flow through impacts on land tenure, property, and environmental management.

In this CALL TO ACTION, we call on all FIG Member organisations, affiliates, and surveying professionals, particularly in the Asian Region, to become involved in climate-responsible land governance and disaster resilience, including safeguarding land rights as per the CALL TO ACTION resolutions below.

CALL TO ACTION

1 ***Continue to Engage and Bridge the Gaps***

1.1 Identify gaps in practical knowledge, capacity, implementation, resources, and coordination within the region related to addressing climate change and disaster challenges with a focus on safeguarding land rights of vulnerable groups when using spatial data for climate action and disaster recovery.

1.2 Bridge the gaps in the region by empowering, engaging and building the capacity of communities, professionals and organisations to effectively address climate change, support disaster recovery, and safeguard land rights of vulnerable groups through the use of spatial data.

2 ***Unite for Collaborative Partnerships: From Local Action to Global Impact – Connecting Professionals to Advance Spatial Governance***

2.1 Establish collaborative regional partnerships among (sub-)national and regional institutions (academic, professional, civil society) for effective practical knowledge sharing and technology transfer to address the multifaceted challenges of climate change, disaster management, land-climate nexus, and transboundary climate issues. Strengthen regional collaboration to build capacity for government to engage in a context specific way at local levels.

2.2 Create a collaborative regional professional forum that brings together government authorities, professionals, academicians, civil society organisations, private sector and development partners from across the region that will advocate and facilitate knowledge sharing of use cases, best practices and knowledge, technology transfer, to support coordinated climate action and disaster recovery by using spatial data, focusing on safeguarding land rights and promoting sustainable development.

2.3 Establish a platform for regional dialogue to align policies and strategies on climate change and disaster resilience, ensuring coordinated efforts and government-led support across the region.

2.4 Implement a mechanism to evaluate the impact of collaborative efforts, allowing continuous improvement and optimisation of regional partnerships and initiatives.

3 ***Measure and Monitor Climate Change and Natural Disaster***

3.1 Create further practical knowledge and capacity regarding positioning and measurement, engineering surveys, quality assessment and standard setting to measure, monitor and verify climate change and natural disaster as it affects land, water and marine, in partnership with environmentalists at the regional, national and local levels.

3.2 Encourage regional and international organisations to produce manuals and standards that support the localisation of knowledge and enable local (national or sub-national government) ownership of actions, by guiding the development of rapid procedures for addressing climate change and managing disasters. Comparative studies of country-level land systems and responses can help achieve this goal.

4 ***Govern through Strategic Land Governance***

4.1 Develop climate responsive land governance frameworks and fit-for-purpose land administration by leveraging on the UN-GGIM Framework for Effective

Land Administration (FELA) and global land and environmental frameworks, also to support the Sustainable Development Goals (SDGs).

4.2 As actions to combat climate change often affect land and property, establish transparent digital database systems for the registration of property ownership, as well as recording the land rights and values. Develop land literacy to help citizens to make informed decisions.

4.3 Improve the transparency in the real estate markets to increase public acceptance of compensation (financial or otherwise) and of the advantages and disadvantages for the value of land and property (registered and unregistered) resulting from measures to combat climate change, noting that transparency is country context specific.

4.4 Re-design survey systems to better support national environmental goals on carbon, biodiversity and degradation/restoration, land use change, (NDCs, NBSAPs, LDN, NAPs), for adaptation, mitigation and loss and damage, and for managed retreat. Re-design to support national carbon emission reduction sector plans (e.g. transport, agriculture, forestry, mining) balanced with economic growth, poverty reduction and just transition by supplying geodata for scenario planning and decision making.

4.5 Strengthen coordination and partnership within and across government to safeguard land rights, undertake climate action, disaster recovery and promote sustainable development in the face of climate change and natural disaster.

4.6 Enhance policy, legal, regulatory and institutional frameworks and national dialogues for climate action and to respond to natural disaster. This includes recognising all forms of tenure, including women's and girls' land rights, sorting out regulatory conflicts, regulating the fair settlement of conflicts and identifying the effects of climate protection on the value of real estate. Policies, regulations and institutional reform need to be put in place regarding rehabilitation, relocation, valuation and compensation, including appropriate rural and urban planning.

4.7 Strengthen capacity to respond to evolving sustainability legislation and regulations and disclosure standards.

4.8 Create user friendly portals and platforms for local authorities to better manage their land and water resources and respond to their local communities, including Indigenous People.

4.9 Develop strategic land use planning and spatial data infrastructure/land information systems for disaster management through consultative, inclusive, gender-responsive and participatory approaches.

4.10 Empower communities through awareness raising about risk, early warning, insurance and access to investment. Integrate citizen data into the wider data system.

4.11 Empower youth, women, Indigenous People and local communities to advocate for and influence policy by supporting the creation of youth-led advocacy networks and campaigns that focus on safeguarding land rights and promoting climate-resilient land governance.

5 *Respond to Disaster and Protect People and Planet*

5.1 Promote natural disaster resilience for communities, professionals, and organisations by developing practical knowledge and capacity for rapid response, disaster recovery and reconstruction, including supplying data for early warning systems, emergency management, and forecasting.

5.2 Strengthen the work of surveyors through creating a climate resilient budgetary and financing system that overcomes the climate and land silos.

5.3 Strengthen access to the Loss and Damage fund for valuation, expropriation and compensation for vulnerable communities.

6 Innovate, Value, Protect: Advancing Land Valuation for Sustainable Risk Management

6.1 Develop innovative and participatory approaches to land and property valuation such as addressing the needs of vulnerable groups, determining non-market and ecological values, and assessing risks and vulnerabilities.

6.2 Enhance understanding on the importance of land and property valuation work in disaster management and recovery particularly in determining insurance claims and compensation for damages, ensuring fair and adequate financial support for affected individuals and communities, and for implementing post-disaster recovery and reconstruction plans.

7 Empower Land Practitioners

7.1 Develop practical knowledge and capacity to utilise spatial data and innovative technologies for climate action planning and assessment of disaster vulnerability, risk and tenure insecurity before and after disaster.

7.2 Strengthen capacity to design methodologies for measuring climate impacts by evaluating various sources of technical innovation, available datasets, data interoperability, data cleaning capabilities, affordability, addressing the digital divide, and the availability of open source, climate models, digital twins, simulation, scenario development and spatial analytics. The Land Administration Domain Model/Social Tenure Domain Model could reduce costs for data creation and provision.

7.3 Develop the capacity to use spatial data at the right scale for regional and national settings for forecasting of events, scenario development, planning and implementation for managing vulnerable groups, unstable terrain and national and transnational biodiversity hot spots and balancing environmental goals, food security and land and water governance.

7.4 Develop practical knowledge and capacity to use data on the price of real estate and land, analyse it and gain knowledge on the impacts of climate action and compensation for expropriated land or the protection of its natural resources by the owners or rights holder.

7.5 Strengthen customer relations around new technology capabilities and market segment to improve customer satisfaction. Support customers' climate action regarding integration into their business strategy, showing evidence of climate impact, setting targets/goals, products/services, innovation and transparency.

7.6 Foster youth leadership in climate-resilient land governance through leadership programmes, mentorship opportunities, youth representation in policy forums.

7.7 Develop the capacity to assess the carbon footprint of each product or service.

8 Ethics, Equity, Sustainability: Surveying for a Just Future

8.1 Ensure professional standards on ethics are maintained and enhanced to effectively respond to increasingly complex situations involving emergency technologies.

8.2 Strengthen quality assessment and risk management practices for new technologies, tools, databases, methods and processes being applied for climate action.

8.3 Document best practices and create use cases for the region to build practical knowledge and capacity, and to scale up successful strategies and tailor them to local contexts, thereby enhancing the effectiveness of regional and national responses.

8.4 Identify base minimum requirements and develop iterative fit-for-purpose standards and design, also for the efficient collection of geodata and price data for developed and least developed areas. Strengthen the ability to design for replicability and scale.

9 Climate Responsive Workforce for the Future

9.1 Scale up the capacity and efficiency of the industry work force to respond effectively through training, increased public-private partnerships, government led strategic planning, also with NGOs and CSOs, and the application of new technologies.

9.2 Re-design the curriculum of surveying, land management and valuation education and training with more climate responsive content. Strengthen soft skills on how to negotiate precision, timeliness, relevance, customer needs and modern technology with ethical concerns and in a way that responds to market needs. Strengthen the work force's ability to negotiate fit-for-purpose climate resilient capabilities.

9.3 Integrate youth into disaster resilience strategies by capacity building in disaster risk reduction using modern tools and technologies and supporting youth research and innovation.

10 Innovative Smart and Safe Cities

10.1 Re-design urban and peri-urban systems and create smart cities through the innovative use of data and technology for land use planning, fit-for-purpose land administration, informal settlement upgrading, sustainable waste management, digital services and e-governance, and green and resilient infrastructure. Develop the responsible use of Earth Observation techniques and AI technology to support urban land management.

10.2 Protect the land rights of those who own, occupy, permanently, temporarily, where rights are registered and unregistered during disaster recovery and actions to address climate change. Recognise that climate change often impacts vulnerable groups the most.

INTRODUCTION

Under the banner of the International Federation of Surveyors (FIG), the Nepal Institution of Chartered Surveyors (NICS) hosted a Regional Conference for Asia in Kathmandu from November 14–16, 2024. The theme of the conference was 'Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights.'

The Nepal Institution of Chartered Surveyors (NICS) is the only member association of the International Federation of Surveyors (FIG) in Nepal. Established in 2008, NICS aims to contribute to the professional development and professional security of its members and is continuously making a sincere effort in this line. As part of its efforts in professional development, NICS has collaborated in successfully hosting small-scale international events in 2015, 2019, and 2023. FIG Commission 2 in both the years and FIG Commission 7 in the later year were among the collaborating partners. Building on this experience, NICS has now hosted a Regional Conference for Asia. This event was a unique opportunity to address the pressing challenge of safeguarding land rights amidst the impacts of climate change and disasters in the region. Additionally, NICS hoped that hosting this event would also allow FIG to engage Asian (more specifically South Asian) professional organisations.

NICS has consistently demonstrated its commitment to engaging with FIG on a larger scale and aspires to host a FIG Working Week in Nepal. For the first time, NICS submitted a bid to host the FIG Working Week 2015 during the FIG Working Week 2011 in Rome, Italy. Although the bid was not successful, NICS continued its efforts and, for the second time, submitted a bid to host the FIG Working Week 2027 during the FIG Working Week 2023 in Orlando, USA. Unfortunately, despite a close contest, this bid also did not succeed. In this context, the opportunity to host the FIG Regional Conference is a significant milestone in NICS's journey toward organising larger-scale events. Hosting this conference has provided us with invaluable experience, which will undoubtedly contribute to our future aspirations and endeavours.

VISION OF THE CONFERENCE

The climate crisis represents the single greatest challenge humankind faces to ensure our planet remains sustainable and our people remain resilient. This theme underpins the FIG Council's vision of sustainability over the term 2023–2026. Because of the importance of climate change to the global community, FIG wishes to examine and actively promote the engagement and role that surveyors and land practitioners can play in contributing to the climate change agenda. FIG wishes to lead its members so that they can fully understand, articulate, and use their expertise and knowledge to tackle the important challenges in climate action. This Regional Conference for Asia was intended to be a major milestone in achieving the FIG vision. The NICS, as an FIG Member Association, supported the achievement of this milestone with reference to the Asia region. The Regional Conference was intended to help meet a range of climate challenges in the region such as greenhouse gas emissions/carbon, biodiversity loss, deforestation and large-scale land use change, urban sprawl into agricultural land, water scarcity, and more, considering the safeguarding of the land rights of vulnerable people. The expertise of FIG Members in the region means they are well positioned to make a major contribution to addressing a wide range of land and water related climate change issues.

Surveyors and land practitioners are in the critical path of the sustainability of the planet because of their work on security of tenure, land governance, geospatial information management, land administration and land management, spatial planning and valuation, Building Information Modelling (BIM) and so on. Future generations in the Asia region face an uncertain outlook characterised by an increasingly hostile climate and poorly managed natural disasters. Surveyors and land practitioners in the Asia region, with their critically important skills and knowledge, need to contribute to addressing the climate crisis challenges. The primary aim of this Regional Conference for Asia was to address the pressing challenges posed by climate changes and disasters and their impacts in the region, with a focus on the vital role of effective land governance and resilience. There is an imperative need to share international and regional knowledge and best practices. The Conference was an opportunity for learning, sharing knowledge, providing practical knowledge, and actionable recommendations about how surveyors and land practitioners can address climate and disaster in the region, also for vulnerable populations.

This was done through a focus on 4 thematic areas 1) Climate responsive land governance 2) Natural disaster resilience for communities, professionals and organisations 3) Cooperation and partnerships to safeguard land rights 4) Capacity development for communities, professionals and organisations (see Appendix 1 for the programme). These 4 thematic areas were addressed through several key sub-themes.

1 Climate Responsive Land Governance

1.1 Framework for Effective Land Administration (FELA), Innovative and administration approaches, global land and environmental frameworks.

1.2 Safeguarding land rights of women, youth, vulnerable communities, indigenous people and informal settlers.

1.3 Climate-responsive fit-for-purpose land administration (FFPLA), including land use/spatial planning through consultative, inclusive, gender-responsive, and participatory approaches.

1.4 Land and property valuation for risk management, and non-market and ecological purposes on registered and unregistered land and natural accounting.

1.5 State/public land and buildings management to achieve environmental goals and support vulnerable groups in cities, urban and rural areas.

2 Natural disaster resilience for communities, professionals and organisations.

2.1 Disaster resilience to protect the security of tenure of women, youth, vulnerable communities, indigenous people and informal settlers.

2.2 Adapting land use planning, land administration systems, and Spatial Data Infrastructure/Land Information Systems for disaster management, including through consultative, inclusive, gender-responsive and participatory approaches.

2.3 Using spatial data and technology for climate action planning and assessing disaster vulnerability, risk, and tenure insecurity in pre- and post-disaster scenarios.

2.4 Disaster recovery and reconstruction, including affordable housing and tenure security, participatory slum upgrading, resettlement, food security, infrastructure, and risk insurance.

3 Cooperation and partnerships to safeguard land rights.

3.1 2030 Agenda and Achieving Sustainable Development Goals together.

3.2 Regional Cooperation in addressing land-climate nexus issues and disaster management.

3.3 Partnerships across the region, governments, academia, and civil society.

4 Capacity Development for communities, professionals, and organisations.

4.1 Empowering climate and disaster-resilient communities.
4.2 Building professionals' capacity for climate action.
4.3 Regional collaboration and capacity development.
4.4 Strengthening the technical capacity of professionals for climate action and disaster risk reduction.

OBJECTIVES OF THE CONFERENCE

The main objective of the event was to build knowledge and capacity in the region to address climate change and disaster-induced challenges in safeguarding the land rights of vulnerable groups, emphasising the critical role of land governance and resilience. An outcome of the conference was the participants are more able to identify entry points for climate and disaster actions. National and regional case studies of best practices and use cases of useful products and services were presented for learning through papers, panels, and interactive sessions. The conference was intended to develop a CALL TO ACTION and provide concrete strategies and actionable recommendations for the region so participants would leave with practical insights, tools, and action plans to effectively address and implement climate and disaster actions.

The second objective was to foster collaborative partnerships among national and regional institutions, academics, and professionals to facilitate knowledge sharing and technology transfer at the regional level, and to build FIG's presence in the region. The conference achieved these objectives as demonstrated by the exciting and thought-provoking inaugural and plenary speeches and many technical session presentations from across the region covering a rich diversity of climate topics, as well as a series of parallel World Bank sessions.

This publication is based on the highlights from the Conference and the CALL TO ACTION developed at the Conference, which is intended to engage Governments in the region, as well as professionals, and stakeholders. It features recommendations derived from the event. A dedicated team of experts have produced the publication and ensured quality and relevance.

Delegates, participants, and representatives from across the globe gathered at the FIG Regional Conference 2024 in Nepal.

PARTICIPANTS, NATIONAL AND INTERNATIONAL PARTNER ORGANISATIONS

There were 286 participants coming from 30 countries (see Appendix 2 for the list of participants and countries). They included Government officials, Academics, Researchers, Professionals, Practitioners, Entrepreneurs and the private sector, and Students/ Young Surveyors. Most of the delegates came from Nepal and the Asia region as well as international representatives from FIG, the World Bank, UN-Habitat/GLTN, and other partner organisations (see below) including young surveyors and students. There were also many sponsors.

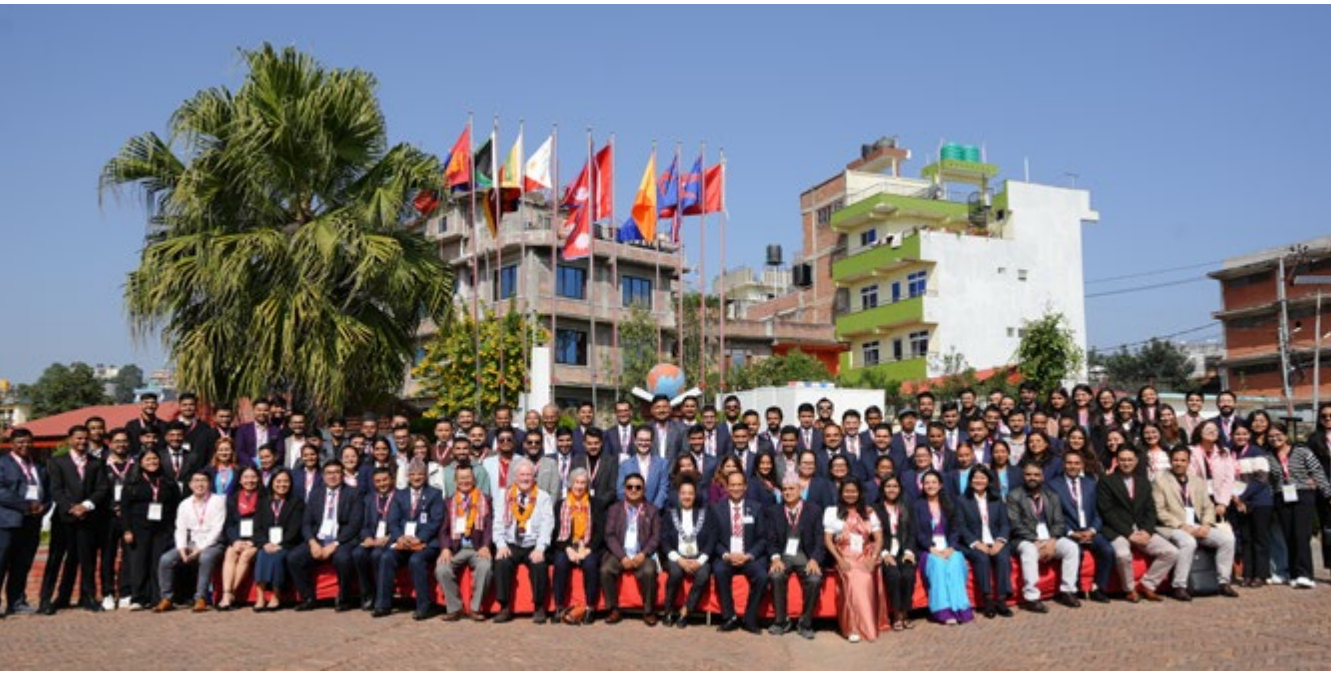
Other meetings were also held either before or during the conference such as:

- Workshop on 'Land Use Planning in Nepal: Opportunities, Challenges, and Prospects' was organised by the World Bank, in partnership with the Ministry of Land Management, Cooperatives and Poverty Alleviation (MLMCPA) and FIG.
- The 5th FIG Young Surveyors Network Asia and the Pacific Meeting 'Empowered Youth for Climate Resilient Lands.'

Many national and international organisations partnered with FIG and NICS on this event including the World Bank, UN-Habitat/GLTN, the International Centre for Integrated Mountain Development (ICIMOD), and Kadaster International.

National partners:

- Ministry of Land Management, Cooperatives, and Poverty Alleviation
- Survey Department of Nepal
- Land Management Training Center, Dhulikhel
- Habitat for Humanity Nepal
- International Centre for Integrated Mountain Development (ICIMOD).



Gathering of Young professionals and delegates at the 5th FIG Young Surveyors Network Asia and the Pacific Meeting at Land Management Training Center.

International partners:

- World Bank)
- UNHABITAT/GLTN
- Kadaster International.

Supporting organisations:

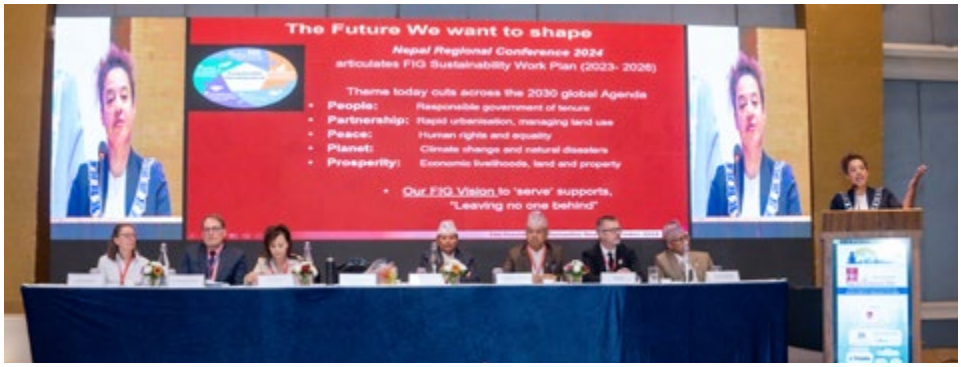
- Community Self Reliance Center (CSRC)
- Nepal Remote Sensing and Photogrammetric Society (NRSPS)
- NAXA
- Department of Geomatics Engineering, Kathmandu University.

Sponsors:

- Platinum Sponsor: Trimble
- Gold Sponsor: Terra-IT
- Bronze Sponsor: Habitat for Humanity, Nepal, Kadaster International, ICIMOD.

FIG:

- FIG Task Force on Climate Compass
- Task Force on FIG and the SDG's
- FIG Commission 2 – Professional Education
- FIG Commission 5 – Positioning and Measurement
- FIG Commission 7 – Cadastre and Land Management
- FIG Commission 9 – Valuation and the Management of Real Estate.

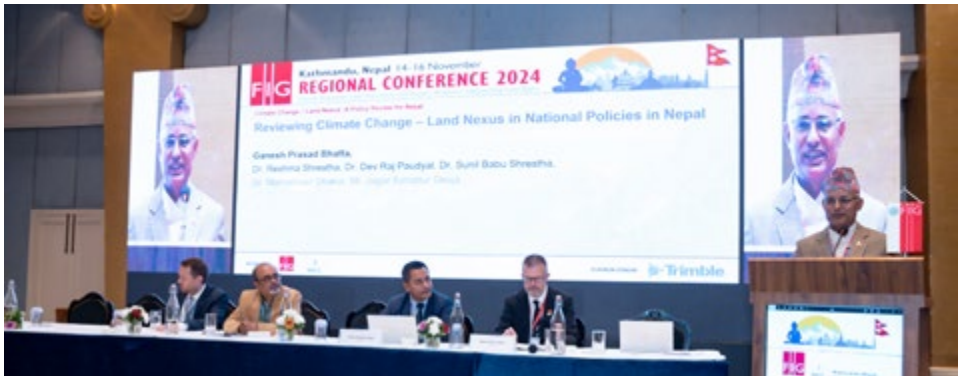


Dr. Diane Dumashie, FIG President, sharing a transformative vision for a sustainable and resilient future during her keynote.

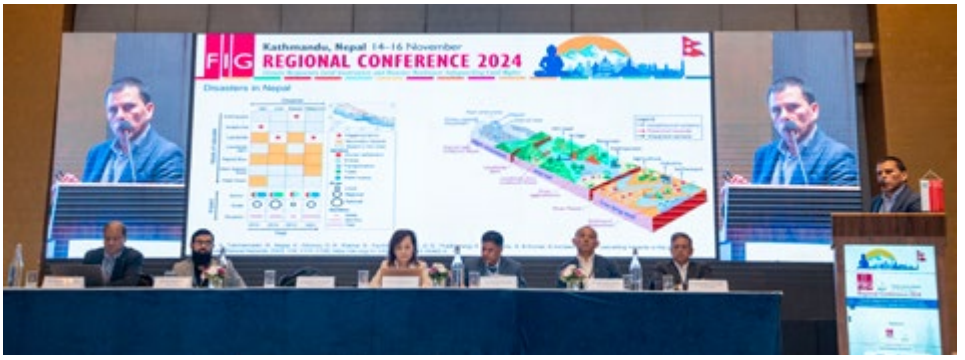
KEY GLOBAL PERSPECTIVES AND MAIN MESSAGES

During the event there were three thought provoking inaugural and plenary sessions that set the scene and provided a global and regional perspective. High-level speakers discussed solutions, challenges, and learnings about surveying, climate, and disaster at regional and country levels. Humanity is facing an unprecedented challenge in terms of the climate crisis. One in two climate issues in Asia relates to land, mostly in the sectors of forestry, energy, transport, environment, agriculture, and solid waste management. Surveyors, because of their role in land are central to the success of achieving the world's environmental goals.

Speakers challenged conventional approaches to land administration and geospatial technology in the face of the climate crisis and discussed the importance of integrating land administration and geospatial data for climate and disaster resilience. Some spoke about what climate-resilient land governance looks like at the national and regional levels, how to safeguard vulnerable communities and strengthen resilience against natural disasters. The need for a roadmap, policy dialogue, and key strategic outputs was raised, aligned to the United Nation's 2030 Agenda Sustainable Development Goals (SDGs). Ways need to be found to influence the United Nations Framework



Mr. Ganesh Prasad Bhatta sharing his insights on the "Climate Change–Land Nexus in National Policies in Nepal" during Plenary Session I: Climate Responsible Land Governance.



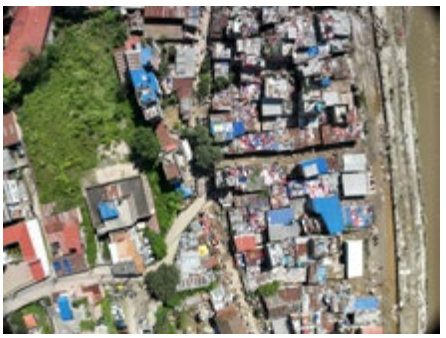
Dr. Jagannath Aryal delivering his presentation on "Disaster Resilience from the Lens of Earth Observation in the Digital Era" during Plenary Session II: Disaster Resilience.

Convention on Climate Change UNFCCC (UN carbon agency), United Nations Convention on Biological Diversity UNCBD (UN biodiversity agency) and United Nations Convention to Combat Desertification UNCCD (UN land degradation/restoration agency) to strengthen the land agenda and make it more people-centred in their deliberations.

Some of the main messages on climate were:

Land administration

- It is hard to find adequately priced urban land for the development of transmission lines, solar panels, hydro-electric projects, landscape and watershed management, and affordable housing. Robust land administration systems are needed to support land assembly to deliver infrastructure, networks, corridors, and affordable housing. Information is also needed on people who own, tenants, renters, and temporary residents. People with informal and temporary residents' rights are particularly vulnerable to the impacts of infrastructure development, posing significant challenges for land acquisition processes.
- An up-to-date registry is needed for climate action to support a state-wide valuation system and to manage public land, including rights to buildings and other public assets. Public assets should be managed effectively to maximise their value and economic contribution, with monetisation being one of the potential strategies. Land use changes drive climate challenges, highlighting the need for effective land use policy and planning.



Informal settlement in Kathmandu. (Photo: Geovation Nepal, Shishir Lamsal)

Rapid urban expansion with inadequate planning (2003 vs. 2023).

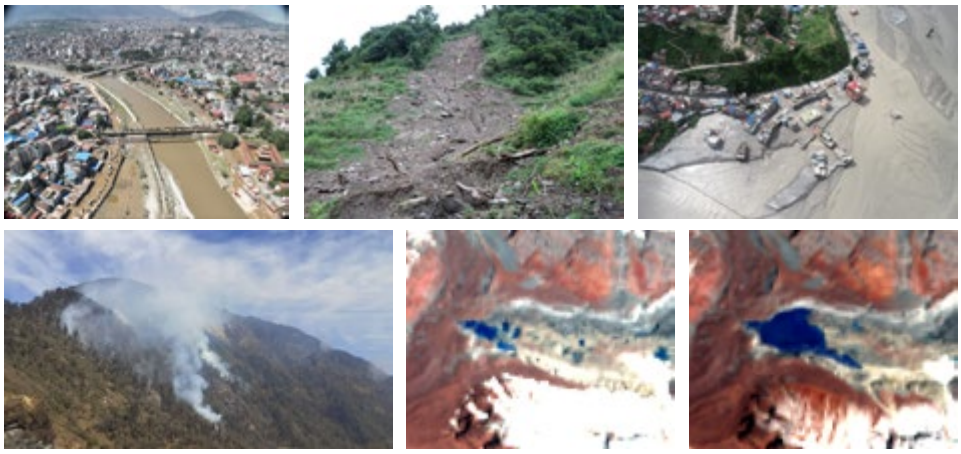
- Individual titling and land markets, and the economic growth model are interconnected and significant contributors to climate change. Current digitalisation approaches are often not community-friendly and do not align with the needs of the Global South. Land administration systems have only limited preparedness for climate resilience.
- Some technical innovation is increasing risks to communities. While drones are used for mapping, these approaches often overlook community land use and tenure rights due to cost and scale limitations. The multiple rights over the same parcel are not accurately mapped, leading banks to refuse mortgage issuance for these properties.
- Robust climate action requires the introduction of multiple tenure systems, including legal pluralism, community tenure, continuum options, decentralised land administration, and community-based Geographic Information Systems (GIS).

Forestland

- 3.3 billion people, 41% of people live within 1 km of forests. 21% of global land is managed by Indigenous People and local communities but only 10% of their rights are legal and formalised.
- Defining forest land is challenging, as it often includes residential and agricultural areas.
- Systematic land registration should cover land rights – private, communal, indigenous, state, and public land. This should be combined with land use classification and forest zoning. For quicker results, fit-for-purpose land survey techniques (possibly with lower survey accuracy) and streamlined adjudication may be used. Formalisation of customary land rights, including those of state forests, is a best practice. Unregistered rights should be compensated during expropriation. Free Prior and Informed Consent procedures should be followed.

Learning from Nepal's experiences

- Nepal has numerous climate challenges such as glacial lake outbursts, landslides/soil erosion, flooding, forest fires, depleted water sources, loss of land,



Major natural disasters in Nepal – floods, landslides, earthquakes, forest fires, and glacial lake expansion and outburst – highlighting the urgent need for disaster management and climate resilience.

desertification, reduced agricultural productivity, biodiversity loss, and water scarcity. These climate challenges have led to landlessness, increased poverty and economic insecurity, forced migration/displacement, disruption of social activities, increased vulnerability, and conflicts over resources.

- Nepal has numerous policy and legal frameworks, but land tenure issues are often overlooked. Land tenure is notably absent from climate discussions. The Ministry of Land Management, Cooperatives, and Poverty Alleviation is not represented in the Government's High-Level Climate Change Steering Committee. There are no specific policies or legal provisions to address post-disaster landlessness.
- Case study evidence shows that Nepal's response to disasters has been weak with only nominal compensation for affected households and no rehabilitation of lost land, houses or agricultural land. This failure endangers the lives and well-being of all affected communities, particularly vulnerable people.
- The country needs sustainable, climate-resilient land management supported by appropriate policy and legal frameworks.

Regarding the impacts of natural disasters, there were several main messages and practical strategies for surveyors and land practitioners in mitigating the impacts of natural disasters on vulnerable communities and landscapes:

Surveyors and natural disasters

- Cascading disasters are more difficult to respond to, and it is harder to be resilient, by comparison to single disaster events. The region is experiencing a wide range of disasters which are affecting land and economies, yet there are insufficient resources to address these challenges.
- Surveyors can play an important role by forecasting future events using spatial data from various sources, and by providing government departments with access to modelling tools and climate data. Supporting inter-departmental coordination and building capacity in advance is vital. Regional collaboration, especially at the policy makers level and raising community awareness are critical.
- Technology and tools are insufficient on their own – experts, such as surveyors, must be capacitated to effectively use them for disaster management. Regional bodies (e.g. Asian Disaster Prevention Center) are working to build individual and institutional capacity in the region. They also support the adaptation of tools to country settings and help integrate climate data into national data systems. This fills the gaps in government capacity and empowers decision-makers with accurate and appropriate information.
- Surveyors should continue to work in their specialised field but to address climate issues holistically, they must collaborate with other experts. This interdisciplinary approach will make it possible to develop policies based on robust scientific evidence.

Learning from Nepal's experiences

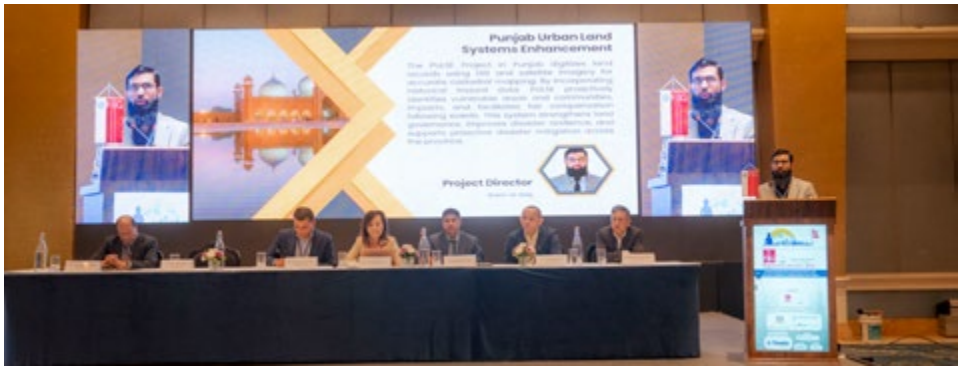
- Evidence from Nepal shows the impact of natural disasters and shows how poor development and settlement planning can contribute to their occurrence. Decision-makers need to be aware of the inevitability of such disasters and proactively design infrastructure and buildings that are resilient to these risks.

- Accurate mapping is important for establishing baselines of land cover, land use, population densities, critical infrastructure and socio-economic vulnerabilities, including elevation models and historical disaster data. Mapping is also needed for monitoring, forecasting and providing relevant and up-to-date thematic information to help plan for disaster planning and to minimise loss of life and damage. Post-disaster needs assessments – such as of population displacement, economic loss and environmental degradation, require up-to-date maps for the reconstruction planning, progress monitoring, and assessing long-term impacts. These maps must be updated frequently.

Learning from Punjab, Pakistan linking of land and natural disaster

- Punjab has many natural disasters such as flooding, earthquakes, droughts, heat waves, fog, and smog.
- Punjab holds 27 million ownership records and 22 million tenant records, some dating back 150 years. These records were digitised after overcoming many challenges, such as mismatches between paper records and ground realities, as well as missing and damaged maps.
- The parcel maps are now linked to the land records into a unified land information system which is connected to the government agency responsible for disaster management.
- Precise land parcel information is used for flood preparedness, vulnerability mapping, data-driven relief efforts, fair compensation to local communities, and emergency response planning.

These main messages from the plenary sessions and the technical sessions are reflected in the CALL TO ACTION.



Mr. Ikram ul Haq delivering his plenary presentation on "Land Rights, Digital Governance, and Disaster Preparedness: A Case Study of PULSE Implementation in Punjab".

SOME HIGHLIGHTS FROM THE TECHNICAL SESSIONS

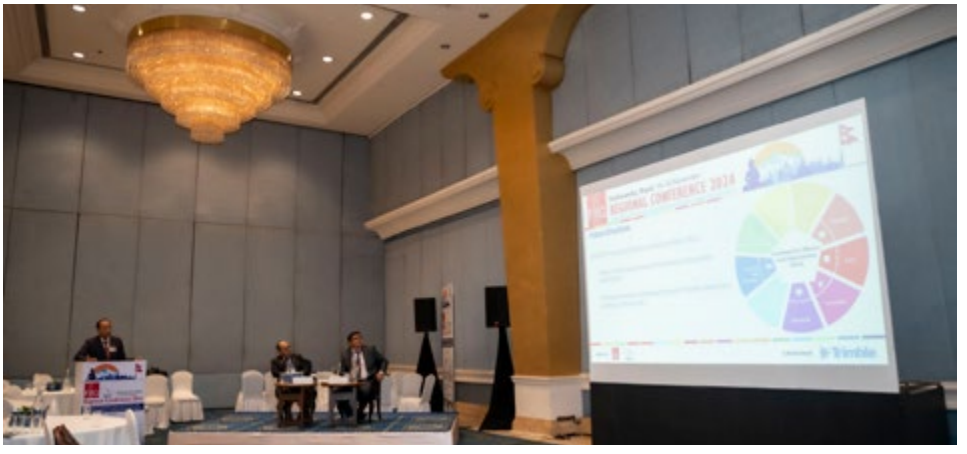
A wide range of use cases, good practices, solutions, and challenges related to both climate and disaster resilience were presented during the technical sessions. Some of these focused on:

Innovative approaches to urbanisation, land management, and climate resilience

- Implementing climate-resilient land governance through innovative survey solutions.
- Addressing urban sprawl's impacts on food security and sustainability by utilising Earth Observation (EO) data for resilient planning.
- Demonstrating how participatory GIS and EO data can enhance climate responsiveness and foster community engagement for climate resilience.
- Advancing waste management strategies through cutting-edge data applications.

Unlocking property values through greater transparency of sustainability effects on the markets

- Enhancing market transparency to mitigate the impacts of climate risks on property values.
- Despite sustainability challenges, innovative strategies can be used to improve property value.
- Exploring the inter-connection between land governance, climate resilience, and market dynamics.
- Establishing a regional community of practice focused on land and property valuation to address the challenges posed by weak land administration systems.
- Effective land and property valuation is critical for municipal governments to generate sufficient revenue to fund essential public services and infrastructure in urban areas.



Mr. Janal Raj Joshi presenting on "Effective Land Administration in the Asia-Pacific Region: Insights from Nepal on Navigating Governance, Legal, and Financial Pathways within the Climate Change".

Climate and disaster-resilient rural land use planning

- Innovative policies and technologies for land use planning.
- Cutting-edge tools are transforming land use planning, enhancing food security, and building climate resilience.
- New tools, including Unmanned Aerial Vehicle (UAV) and multi-hazard warning systems, are being applied in land use planning and precision agriculture.

Enhancing disaster and climate resilience through knowledge and capacity development

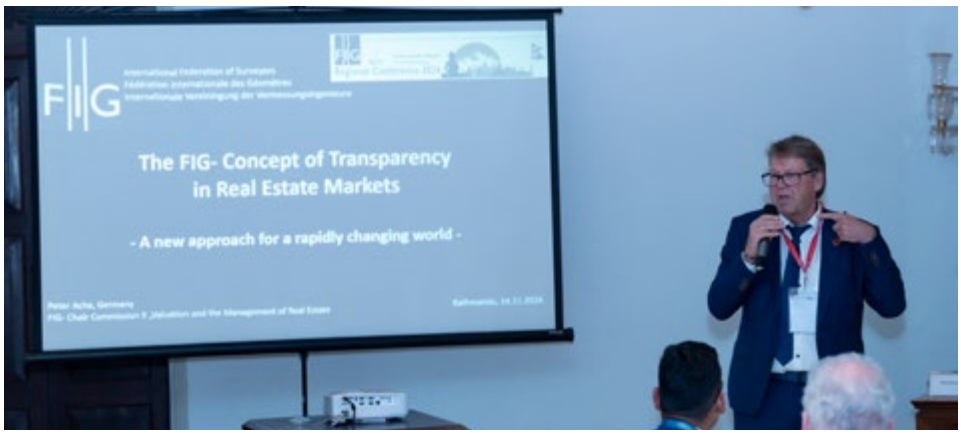
- The future of climate resilience lies in collaborative, knowledge-driven approaches.
- New global perspectives highlight the role of geomatics education in advancing territorial governance.
- Insights into how surveyors can drive transformation by working with communities to build resilient infrastructure.
- Global Navigation Satellite Systems (GNSS) can be leveraged to monitor and safeguard transport networks from natural disasters.

Innovative land administration approaches, global land and environmental frameworks

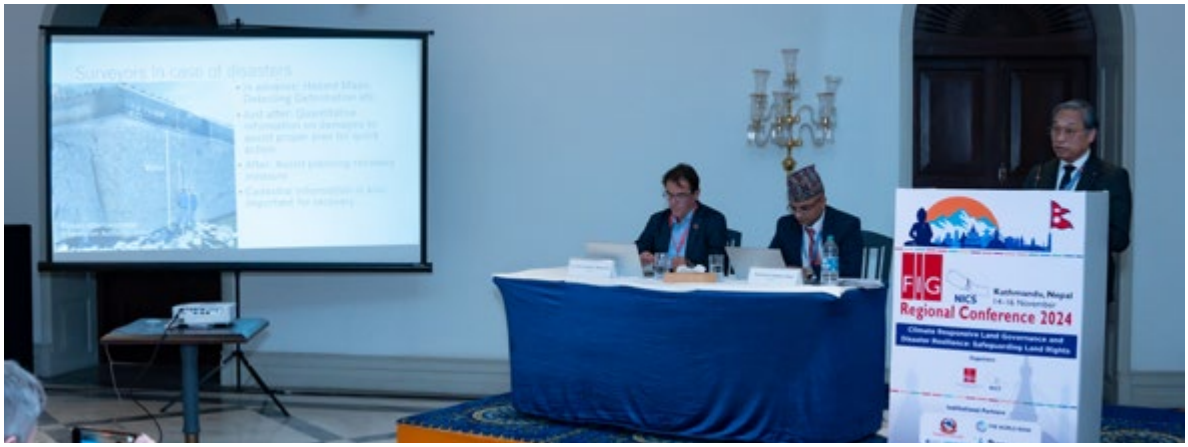
- The power of geospatial data is driving effective climate response with new advancements paving the way for a more sustainable future.
- Innovative land administration strategies are relevant for building resilient communities and advancing sustainable development to address global challenges.
- Artificial Intelligence (AI) is being leveraged for automatic digitisation of historical cadastral maps and tracking shifts in land cover.
- Using modern technology for parcel demarcation in flood-prone areas.
- Asia-Pacific's approaches and capacity for climate-responsive land administration.

Leveraging remote sensing, GIS, and technological innovations for sustainable development

- The latest innovations in remote sensing, GIS, and technology to support sustainable development.



Mr. Peter R. Ache presenting the FIG concept of transparency in real estate markets for informed investment decisions and regulatory actions.

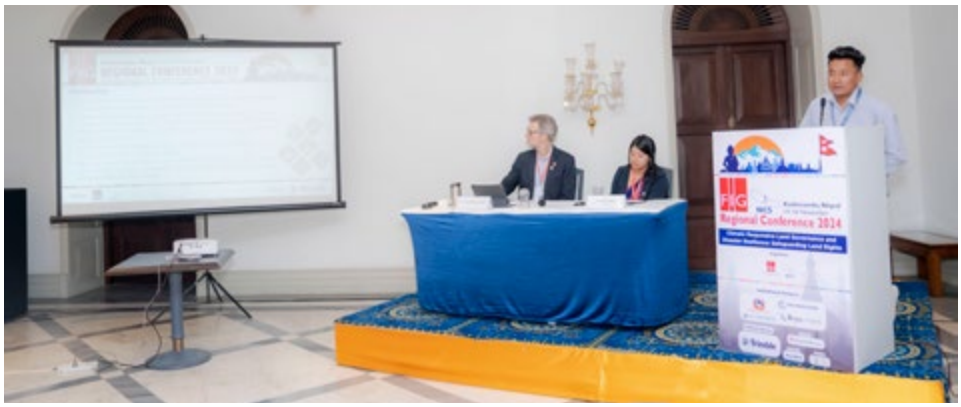


Mr. Masaru Kaidzu presenting on the "Efforts to retain field surveyors in Japan: Enhancing workforce readiness through education and regulatory changes."

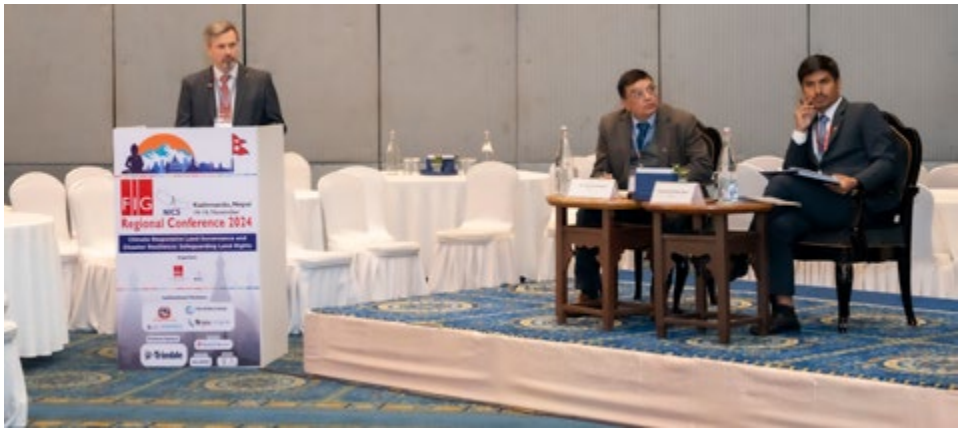
- Transformative applications including monitoring coral reef health, tracking supraglacial lake trends, and deploying low-cost GNSS systems for disaster management.
- Innovative approaches using UAVs, Light Detection and Ranging (LiDAR), geophysical techniques for landslide monitoring, and GNSS for climate-responsive land governance.

Safeguarding land rights amidst the impacts of climate change and disasters

- Safeguarding land rights in the context of climate and disaster challenges.
- Learnings from Nepal's journey on how to balance access to land for the landless while protecting public lands and formalising rights for marginalised communities, driving land management and social justice forward.
- Solutions include land tenure reforms for women, collaborative governance, GNSS data processing for climate and disaster challenges and a Python library to detect inconsistencies in land records and protect land rights.



"Enhancing Land Governance and Disaster Resilience in Bhutan: A Presentation on DrukNet's Role" by Mr. Phurba in Modernizing Geospatial Reference Systems and Monitoring Tectonic Activities.



Mr. Yuri Noyanov presenting innovative GNSS Data Processing solutions to address climate change and disaster-induced challenges in safeguarding land rights.

Property valuation systems, standards and taxation

These sessions, led by Nepal's Ministry of Land Management, Cooperatives, and Poverty Alleviation (MoLCPA) and the World Bank, marked the launch of the new Technical Assistance for the '*Digitalization of Nepal's Land Administration Sector.*'

While cadastral and land registry records are largely digitised, further modernisation is needed to improve efficiency and accessibility. Key issues include the decentralisation of land administration services to municipalities, as required by the Constitution. Nepal's land valuation and taxation systems face several challenges, such as a lack of reliable real-estate valuation data, absence of standardised procedures, overlapping jurisdiction among multiple land-related laws and agencies, a shortage of qualified valuers and the lack of dedicated courses in land and property valuation, Additionally, weak administration structures hinder effective implementation. Modernising these systems is critical to promote a transparent real estate market and enhance revenue generation, hence the need for reinforcing digitalisation efforts in Nepal's land administration system.

Mr. Danilo Antonio from the World Bank presenting on "Land and Property Valuation: Findings and Recommendations from East Asia".

(South) Asia's rapid urbanisation and economic growth are driving significant real estate development. A robust land and property valuation system is vital for enabling informed decisions by governments, investors, and developers while facilitating various societal functions. Such a system underpins property trading, mortgaging, taxation, compensation, planning and financial reporting. Reliable valuation also facilitates the efficient transfer of land rights, supports financing for sub-national governments, and enhances spatial planning. It strengthens banking and financial markets stability by better accounting, lending and insurance.

However, weak land administration systems persist in the region, and property valuation and taxation systems, standards, and professions remain poorly regulated. The challenges were explored, with shared experiences demonstrating how effective land and property valuation can increase revenue generation and improve urban infrastructure and municipal services. Efforts to strengthen learning exchanges were initiated, potentially leading to the establishment of a regional Community of Practice focused on land and property valuation. National representatives from different countries agreed at the roundtable meeting to continue virtual meetings for knowledge sharing and learning. FIG Commission 9 on Valuation and the Management of Real Estate, in collaboration with the World Bank and other partners, will explore ways to support this platform and ensure its sustainability.

CONCLUSION AND SUMMARY

The conference covered a rich and diverse range of topics related to surveying, climate and disaster resilience. The plenary sessions were world class and challenged business as usual approaches to land administration, geospatial technology and data approaches, and capacity in the face of the climate crisis. Many speakers addressed what climate resilient land governance looks like at both national and regional levels. They demonstrated how land administration and geospatial data can be integrated to enhance climate and disaster resilience, a topic that was also explored during the technical sessions.

However, surveyors must also focus on developing their soft skills, such as communication, networking, and building relationships with climate professionals to contribute more effectively to climate action. The technical papers were largely presented by experts from the region who are directly impacted by the climate crisis and natural disasters in their countries. For this reason, the technical papers were often cutting edge and world leading. Global experts on climate and disaster resilience could learn a lot from these papers which can be found in the technical programme in Appendix 1, with hyperlinks to the papers.

The CALL TO ACTION agreed upon at the conference is based on innovative regional and national thinking and a range of pioneering actions to address climate change and natural disasters. These actions are useful for governments, professionals, academics and NGOs. For example, one resolution calls for the development of "climate responsive land governance frameworks and fit-for-purpose land administration," while another emphasises the need to "develop practical knowledge and capacity for rapid response, disaster recovery and reconstruction, including supplying data for early warning systems, emergency management, and forecasting." The CALL TO ACTION has already inspired the creation of a regional platform to discuss surveying issues regarding climate

and disaster resilience. If you have not yet read the CALL TO ACTION it can be found at the beginning of this publication (and the website below).
(https://www.fig.net/nepal2024/downloads/call_to_action.pdf)

The conference covered global, regional and mostly national perspectives on climate and disaster. Key discussions focused on climate-responsive land governance and disaster resilience, including strategies for climate-responsive land administration and strengthening land rights, particularly for vulnerable populations, including in forests. Land administration systems were closely linked to the important role of digital technologies in disaster preparedness. Several regional challenges were identified, such as accessing land in urban areas for green projects and infrastructure, as well as the need for better collaboration and coordination. Other challenges are related to addressing capacity gaps and keeping pace with the continuous development of new technologies.

The technical sessions used the climate and disaster lens to examine a range of topics ranging from urbanisation, rural land use planning, knowledge and capacity development, innovative land administration, technology, and safeguarding people's land rights in the face of the climate crisis. The World Bank led a set of sessions on promoting sustainable land use planning, modernising land administration, and effective land and property valuation for the region.

Finally, young surveyors played a dominant role in the conference, not only in organising, but also in presenting papers, including at the pre-event of the 5th FIG Young Surveyors Network Asia and the Pacific Meeting on 'Empowered Youth for Climate Resilient Lands.' During this event, Shristi Paudel in her opening speech quoted Shirley Tendai Chapunza, the Chair of the FIG Young Surveyors Network. Shristi inspired the audience with an additional CALL TO ACTION from young surveyors quoting Shirley, "As surveyors, we are positioned at the forefront of addressing some of Asia and the Pacific's most pressing challenges, especially around climate change and sustainable land use. Let's collaborate and lead with purpose, ensuring that the future we build together is one that thrives for generations to come."

USEFUL REFERENCES

The plenary sessions and technical papers gave many useful solutions and practical strategies. These can be accessed in the FIG technical programme in Appendix 1 below or online at
https://www.fig.net/resources/proceedings/fig_proceedings/nepal/techprog.htm

If you want to know the environmental goals that your country has set see the 4 websites below:

- UN Framework Convention on Climate Change: Nationally Determined Contribution (NDC) registry. This shows each countries' commitment regarding carbon and the reduction of greenhouse gas emissions. Read your countries report and see how it impacts land and water noting that land use, land use change and forestry cover are included in 90 country reports. Note that Europe has 1 NDC for Europe as a whole.
  https://unfccc.int/NDCREG
- UN Convention on Biological Diversity: National Biodiversity Strategies and Action Plans (NBSAP) country reports. This shows each countries' commitment

regarding biodiversity loss. Read your countries report and see how it impacts land, water and marine.
https://www.cbd.int/nbsap/search/

- UN Convention to Combat Desertification: Land Degradation Neutrality targets and country reports. This shows each countries' commitment regarding land degradation and the restoration of land. Read your countries report and see how it impacts land.
https://www.unccd.int/our-work/country-profiles
- UN Framework Convention on Climate Change: National adaptation strategies reports. This shows each countries detailed plan on how they will adapt to climate change. Some country reports, such as Nepal, break it down by sector making it easier to assess the land and water aspects and the role of surveyors.
https://napcentral.org/submitted-naps

UN Office for Disaster Risk Reduction: Sendai Framework for Disaster Risk Reduction 2015–2030. This framework is a roadmap for how to make communities safer and more resilient. It also covers 'Building back better' in recovery, rehabilitation and reconstruction.
https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

Fifty seven percent of NDC country reports identify forests. Forest do not just cover forest areas but also include towns and agricultural areas. A new publication from the World Bank is a practical guide on how surveyors can engage with forest issues. Childress, M., Berning, C., Kukkonen, M,. Huntington, H. and J. Lisher (upcoming), Good practices for strengthening land rights recognition in forestlands of the east Asia and Pacific region, World Bank and Progreen (final publication out in early 2025).

The FIG Climate Compass Task Force, from its various seminars and webinars, has placed several recordings of top line speakers on YouTube. Speakers are from different regions in the world and speak on a wide variety of surveying and climate action topics.
https://www.youtube.com/@FIGClimateCompassTaskForce

'Geospatial In Action: Data and Insights for the Sustainable Development Goals' (2021) is produced by the UN Geospatial Network. It is a publication that showcases and demonstrates the breadth and wealth of the use and contribution of geospatial information to deliver the SDGs. It reviews each of the 17 SDGs in sequence and notes the specific use of geospatial information and the role of United Nations entities to provide the data and insights for action for a better world.
https://digitallibrary.un.org/record/4004389?v=pdf

'Examples of the implementation of the SDGs Geospatial Roadmap: disaggregating the SDGs by geographic location'. This report discusses examples of how countries, and the SDG Custodians Agencies that support countries, are disaggregating the SDGs by geographic location in the context of the SDGs Geospatial Roadmap.
https://unstats.un.org/UNSDWebsite/statcom/session_54/documents/BG-3a-Examples-of-the-implementation-of%20the-Geospatial-SDG-Roadmap-E.pdf

APPENDIX 1. TECHNICAL PROGRAMME

Programme at a Glance

THURSDAY 14 NOVEMBER			
09:00–10:45	Opening Ceremony		
10:45–11:15	Tea Break		
11:15–12:45	Plenary Session I : Climate Responsible Land Governance		
12:45–13:45	Lunch		
13:45–15:15	TS01A: Innovative Approaches to Urbanization, Land Management, and Climate Resilience	TS01B: Unlocking Property Values through Greater Transparency of Sustainability Effects on the Markets	TS01C: Towards a Modern and Localized Land Administration System: Launch of the Technical Assistance on the Digitalization of Nepals Land Administration Sector
15:15–15:45	Tea Break		
15:45–17:15	TS02A: Climate and Disaster Resilient Rural Land Use Planning	TS02B: Enhancing Disaster & Climate Resilience through Knowledge and Capacity	TS02C: Property Valuation Systems and Standards: Addressing Challenges and Unlocking Opportunities
18:00–21:00	Welcome Dinner (Included in Registration Fee)		
FRIDAY 15 NOVEMBER			
08:00–08:45	TM01: Meeting on Call to Action		
09:00–10:45	Plenary Session II: Disaster Resilience		
10:45–11:15	Tea Break		
11:15–12:45	TS03A: Innovative Land Administration Approaches, Global Land and Environmental Frameworks	TS03B: Leveraging Remote Sensing, GIS, and Technological Innovations for Sustainable Development	TS03C: Towards Effective Property Valuation and Taxation: Lessons, Analytics, and New Horizons
12:45–13:45	Lunch		
13:45–15:15	TS04A: Safeguarding Land Rights amidst the Impacts of Climate Change and Disasters	TS04B: Partner Spotlights	TS04C: Round Table Discussion on Property Valuation and Taxation
15:15–15:45	Tea Break		
15:45–17:15	Closing Ceremony		
SATURDAY 16 NOVEMBER			
04:30–17:00	Technical/Social Tour		

Technical Programme (Papers)

Thursday, 14 November 09:00–10:45 • Regal Ballroom, Hotel Yak and Yeti, Kathmandu

Inaugural Ceremony

Chair: Mr. **Tirtha Bahadur Pradhanang**, President of NICS

- ***Inaugural address by Hon' Balaram Adhikari Minister for Land Management, Cooperatives and Poverty Alleviation Government of Nepal***

[Address in English and Nepalese]

- ***Diane Dumashie*** (United Kingdom): Land Governance for Climate Action: The Imperative for Land Professionals to Act (12943)

[handouts]

- ***Mika-Petteri Torhonen*** (Finland): Keynote Presentation: Access to Land for Climate Goals in South Asia Region (12942)

[abstract] [handouts]

Thursday, 14 November 11:15–12:45 • Regal Ballroom, Hotel Yak and Yeti, Kathmandu

Plenary Session I: Climate Responsible Land Governance

Chair: Mr. **Mikael Lilje** (Sweden)

Rapporteur: Mr. **Susheel Dangol** (Nepal)

- ***Pranab Ranjan Choudhury*** and **Richa Joshi** (India): Making a Case for Climate Responsive Land Administration (12952)

[abstract] [handouts]

- **Malcolm Childress**, **Cynthia Berning** (USA), ***Markus Kukkonen*** (Laos, PDR), **Heather Hungtington** and **Jennifer Lisher** (USA): Strengthening Land Rights Recognition in Forestlands (12879)

[abstract] [handouts]

- ***Ganesh Prasad Bhatta***, **Reshma Shrestha**, **Dev Raj Paudyal** and **Sunil Babu Shrestha** (Nepal): Reviewing Climate Change – Land Nexus in National Policies in Nepal (12913)

[abstract] [handouts]

- ***Paula Dijkstra*** (Netherlands): Unlocking the Power of Geospatial Data for Sustainable Development by the Surveying Community (12897)

[abstract]

Thursday, 14 November 13:45–15:15 • Regal II, Hotel Yak and Yeti, Kathmandu

TS01A: Innovative Approaches to Urbanization, Land Management and Climate Resilience

Commission: 8

Chair: Dr. **Reshma Shrestha** (Nepal)

Rapporteur: Mr. **Prashant Ghimire** (Nepal)

- ***Madhu Sudan Adhikari***, **Subash Ghimire** (Nepal) and **Dev Raj Paudyal** (Australia): Urban Expansion and Its Consequences: Impacts on Food Security and Environmental Sustainability (12875)

[abstract] [paper] [handouts]

- ***Rekha Poudel***, **Rubi Chaulagain**, **Binita Adhikari** and **Rojina Baral** (Nepal): Developing Criteria for Identifying Open Spaces for Disaster Preparedness in Rural Nepal (12906)

[abstract] [paper] [handouts]

- ***Ashish Rijal***, **Aayushma Timalsina**, **Rakshya Khatri**, **Ayusha Kumari Sah** and **Soniya Mehta** (Nepal): Integrated Approach to Waste Management in Banepa Municipality: Combining Geographic Information System, Analytical Hierarchy Process and Network Analysis for Landfill Site Selection and Route Optimization (12908)

[abstract] [paper] [handouts]

- ***Nok Hang NG*** (Hong Kong SAR, China): Unlocking the Potential of Earth Observation Data in Cultivating a Climate-Resilient City (12934)

[abstract] [paper] [handouts]

- ***Aashish Gautam*** (Nepal): Exploring Urban Greenery: A Case Study of Roadside Trees in Pokhara Metropolitan City (12954)

[abstract] [paper] [handouts]

Thursday, 14 November 13:45–15:15 • Platinum Hall, Hotel Yak and Yeti, Kathmandu

TS01B: Unlocking Property Values through greater Transparency of Sustainability Effects on the Markets

Commission: 9

Chair: Mr. **Peter R. Ache** (Germany)

Rapporteur: Mr.**Harisharan Nepal** (Nepal)

- ***Peter R. Ache*** (Germany): Misbehaving of Markets and the FIG-Goal of Transparency on Real Estate Markets (12902)
[**abstract**] [**handouts**]
- ***Hrvoje Tomić***, **Samanta Bačić**, **Miodrag Roić** and **Goran Andlar** (Croatia): Exploring the Urban Green Infrastructure Index: A Case Study of Zagreb, Croatia (12904)
[**abstract**] [**paper**] [**handouts**]
- **Victor Olonde** (Kenya), **Raja Ram Chhatkuli** (Nepal), **John Gitau**, ***Hellen Ndungu*** and **Robert Lewis Lettington** (Kenya): Global Valuation Practice: Lessons for Nepal (12914)
[**abstract**] [**paper**] [**handouts**]
- ***Wolfgang Glunz*** (Germany): The Impact of Climate Risks on the Value of Real Estate Properties – How a Transparent Real Estate Market May Provide Solutions – As a Basis for Discussion (12916)
[**abstract**] [**handouts**]

Thursday, 14 November 13:45–15:15 • Regal I, Hotel Yak and Yeti, Kathmandu

TS01C Towards a Modern and Localized Land Administration System: Launch of the Technical Assistance on the Digitalization of Nepals Land Administration Sector

Co-organisers: World Bank and Ministry of Land Management, Cooperatives, and Poverty Alleviation (MLMCPA)

Chair: Mr. **Dongkyu Kwak** (USA), Senior Land Administration Specialist, World Bank

Key Messages

- Mr. Mika-Petteri Torhonen (Finland), Global Lead on Land, World Bank
- Mr. Arjun Prasad Pokharel (Nepal), Secretary, Ministry of Land Management, Cooperatives and Poverty Alleviation (MLMCPA)

Presentations

- **Land Administration System in Nepal: Challenges, Initiatives and Plans**
Mr. Ganesh Prasad Bhatta (Nepal), Joint Secretary, Ministry of Land Management, Cooperatives and Poverty Alleviation (MLMCPA)
[**handouts**]
- **Technical Assistance on the Digitalization of Nepal's Land Administration Sector: Overview and Next Steps**
Mr. Danilo Antonio (South Korea), Land and Geospatial Specialist, World Bank
[**handouts**]

Comments/Reactions

- Mr. Prakash Joshi (Nepal), Director General, Department of Survey, MLMCPA
- Q and A

Closing

Thursday, 14 November 15:45–17:15 • Regal II, Hotel Yak and Yeti, Kathmandu

TS02A Climate and disaster resilient rural land use planning

Commission: 8

Chair: Mr. **Janak Raj Joshi** (Nepal)

Rapporteur: Mr **Tanka Prasad Dahal** (Nepal)

- ***Vivek Dumre***, ***Monika Manandhar***, ***Rajan Adhikari***, ***Sunil Sah***, ***Susmita Chaudhary***, **Ajay Thapa**, **Janak Raj Joshi** and **Reshma Shrestha** (Nepal): Assessment of Land Degradation in Khotang District using Remote Sensing and GIS (12864)
[**abstract**] [**paper**] [**handouts**]
- ***Gonpo Tenzin*** (Bhutan), **Chencho Tshering**, **Pema Wangda** and **Tika Chhetri** (Bhutan): National Land Use Zoning: A Harmonized Land Use System Towards Climate Responsive Land Governance (12882)
[**abstract**] [**paper**] [**handouts**]

• ***Tanka Prasad Dahal***, **Purna Bahadur Nepali** and **Reshma Shrestha** (Nepal): Policies and Institutions for Land Use Planning in Nepal: Implementation Status Review for Food Security (12922)
[abstract] [handouts]
• ***Binod Prasad Bhatta***, **Gorakh Nath Pandey**, **Mamta Kadel**, **Sadikshya Adhikari**, **Manoj Kumar Bhat** (Nepal), **Shangharsha Thapa** (Sweden), **Sujan Sapkota** and **Shreejan Pokharel** (Nepal): Precision Agriculture in Nepal: Multiphase Evaluation of Wheat Genotypes Using Multispectral UAV Imageries (12923)
[abstract] [paper] [handouts]
• ***Ashok Shrestha*** (Nepal): Application of Web Based Model on Land Pooling (12926)
[abstract] [paper] [handouts]
• ***Kiran Bhusal***, ***Ashok Thakulla*** and ***Aarati Poudel*** (Nepal): Multi-Hazard Early Warning System(MHEWS) in Janaki Rural Municipality: A GIS Perspective (12929)
[abstract] [paper] [handouts]

Thursday, 14 November 15:45–17:15 • Platinum Hall, Hotel Yak and Yeti, Kathmandu
TS02B: Enhancing Disaster & Climate Resilience through Knowledge and Capacity
Commission: 2
Chair: Dr. **Dimo Todorovski** (Netherlands)
Rapporteur: Mr. **Ram Kumar Sapkota** (Nepal)
• ***Angel Collado*** (Spain): A Global Perspective on Geomatics Education for Territorial Governance (12884)
[abstract] [handouts]
• ***Masaru Kaidzu*** (Japan): Effort to Keep Number of Field Surveyors (12886)
[abstract] [paper] [handouts]
• ***Achut Krishna Pandey***, **Subash Ghimire** and **Suresh Chaudhary** (Nepal): A Community-Driven Approach to Landslide Hazard Mapping, Risk Assessment and Management in Nepal (12887)
[abstract] [paper] [handouts]
• ***John Brock*** (Australia): How Surveyors Have Changed the World Part II! (12924)
[abstract] [paper] [handouts]
• ***Jun Wang***, ***Ryan Keenan*** and **Lee Hellen** (Australia): Enhancing Natural Disaster Resilience in Transportation Infrastructure Using Kurloo GNSS Monitoring (12950)
[abstract] [handouts]

Thursday, 14 November 15:45–17:15 • Regal I, Hotel Yak and Yeti, Kathmandu
TS02C Property Valuation Systems and Standards: Addressing Challenges and Unlocking Opportinities
Commission: World Bank
Chair: Dr. **Mika-Petteri Törhönen** (Finland)
Rapporteur: Mr. **Danilo Antonio** (Korea, Republic of)
[Full concept note and programme]
• ***Subash Ghimire*** (Nepal), **Danilo Ramos Antonio** (Philippines), **Markus Olavi Kukkonen** (Finland) and **Ganesh Prasad Bhatta** (Nepal): Land and Property Valuation in Nepal (12889)
[abstract] [paper] [handouts]
• ***Upuli Perera*** (Sri Lanka): Land and Property Valuation and Taxation in Sri Lanka (12973)
[abstract] [handouts]
• ***Prem Bdr. Chhetri*** (Bhutan): Land and Property Valuation and Taxation in Bhutan (12974)
[abstract] [handouts]

Friday, 15 November 08:00–08:45 • Senator Meeting Room (organiser room)
TM01 – Meeting on Call to Action
Chair: Dr. **Clarissa Augustinus** (Ireland)
[Call to Action Document]

Friday, 15 November 09:00–10:45 • Regal Ballroom, Hotel Yak and Yeti, Kathmandu
Plenary Session II: Disaster Resilience
Chair: Ms. **Winnie Shiu** (Hong Kong SAR, China)
Rapporteur: Dr. **Subash Ghimire** (Nepal)
• ***Birendra Bajracharya*** (Nepal): Earth Observation Applications for Enhanced Resilience to Climate-induced Disasters (12944)
[abstract] [handouts]

• ***Rishiraj Dutta*** (Thailand): Capacitating Southeast Asia through the use of Geospatial Technology and Earth Observation Data for Improved Decision-Making (12925)
[abstract] [handouts]
• ***Jagannath Aryal*** (Australia): Disaster Resilience from the Lens of Earth Observation in the Digital Era (12938)
[abstract] [handouts]
Ikram Ul Haq and **Nabeel Javed**, Director General, Punjab Land Records Authority (Pakistan): Land Rights, Digital Governance, and Disaster Preparedness: A Case Study of PULSE Implementation in Punjab (12941)
[abstract] [handouts]
• ***Manandhar Dinesh*** (Japan): Low-Cost GNSS Receiver Systems for Disaster Management, Dynamic Air-Quality Monitoring, and Gateless Toll Gate (12959)
[abstract] [handouts]

Friday, 15 November 11:15–12:45 • Regal II, Hotel Yak and Yeti, Kathmandu

TS03A: Innovative Land Administration Approaches, Global Land and Environmental Frameworks

Commission: 7
Chair: Mr **Shaharuddin Musa** (Malaysia)
Rapporteur: Mr **Sudeep Shrestha** (Nepal)

• ***Nabin Kumar Sah***, ***Bishal Khatri*** and **Subash Ghimire** (Nepal): Modern Approaches of Land Parcel Frequent Demarcation of Highly Flooded Prone Zone of Koshi River Basin (12880)
[abstract] [paper] [handouts]
• ***Sanjeevan Shrestha***, **Tina Baidar** and **Shangharsha Thapa** (Nepal): Improving Cadastral Accuracy for Disaster Management: The Role of Segment Anything Model (SAM) in Digitizing Historical Cadastral Maps (12895)
[abstract] [paper] [handouts]
• ***Muhammad Sheraz Ahsan***, **Salman Atif** (Pakistan), **Christiaan Lemmen** (Netherlands), **Ejaz Hussain** (Pakistan) and **Mila Koeva** (Netherlands): Assessing Urban Land Administration Capacity to Achieve 2030 Agenda for Sustainable Development in Pakistan (12905)
[abstract] [paper] [handouts]
• **Eva-Maria Unger**, **Claudia Lindner** (Netherlands), **John Gitau** (Kenya), **Raja Ram Chattkuli** and ***Janak Raj Joshi*** (Nepal): Effective Land Administration in the Asia-Pacific Region: Insights from Nepal on Navigating Governance, Legal, and Financial Pathways within the Climate Change – Land Nexus (12918)
[abstract] [paper] [handouts]
• ***Narayan Thapa*** and **Sushant Sharma** (Nepal): Integrating Machine Learning and Community-Based Approaches for Enhanced Early Warning Systems in Cascading Hazard Zones: A Case Study from Melamchi, Nepal (12951)
[abstract] [paper] [handouts]
• ***Pragya Pant***, **Narayan Thapa**, **Sujan Nepali** and **Suman Sanjel** (Nepal): Land Cover Change Before and After the Sendai Framework of Disaster Risk Reduction (12953)
[abstract] [paper] [handouts]

Friday, 15 November 11:15–12:45 • Platinum Hall, Hotel Yak and Yeti, Kathmandu

TS03B: Leveraging Remote Sensing, GIS and Technological Innovations for Sustainable Development

Commission: 5
Chair: Dr. **Ryan Keenan** (Australia)
Rapporteur: Ms **Tina Baidar** (Nepal)

• ***Pradeep Upadhyay***, ***Prawal Parajuli***, ***Arun Bhomi***, ***Rabina Poudyal*** and ***Yubraj Kawar*** (Nepal): Assessing Coral Reef Changes through Supervised Classification and its Correlation with SST and Chlorophyll-A: A Remote Sensing Approach (12876)
[abstract] [paper] [handouts]
• ***Sandesh Upadhyaya***, **Prabin Gyawali**, **Shanker KC**, **Suresh Shrestha** and **Stallin Bhandari** (Nepal): The Fundamental Role of GNSS in Modern Surveying and Mapping to Support Climate Responsive Land Governance and to Enhance Disaster Resilience (12890)
[abstract] [paper] [handouts]

• ***Sanchitha Lakshan Witharana*** and **Eranda Gunathilaka** (Sri Lanka): Utilizing UAV, LiDAR, and Subsurface Geophysical Mapping Techniques for Comprehensive Landslide Monitoring in Sri Lanka (12899)
[abstract] [handouts]
• **Chokila Chokila**, ***Phurba Phurba***, **Kinzang Thinley**, **Jamphel Gyeltshen** (Bhutan) and **Rui Fernandes** (Portugal): Enhancing Land Governance and Disaster Resilience in Bhutan through DrukNet (12917)
[abstract] [paper] [handouts]
• ***Sudipta Poudel***, ***Aman Manandhar***, **Pratima Thapa** and **Asmita Banepali** (Nepal): Yield Estimation of Rice Using Multispectral Imagery from UAV in Nepal (12919)
[abstract] [paper] [handouts]
• ***Kabiraj Rokaya*** and ***Shristi Paudel*** (Nepal): Assessment of trend of supraglacial lake development in Western Nepal (12931)
[abstract] [paper] [handouts]

Friday, 15 November 11:15–12:45 • Regal I, Hotel Yak and Yeti, Kathmandu

TS03C Towards Effective Property Valuation and Taxation: Lessons, Analytics, and New Horizons
Commission: World Bank
Chair: Ms. **Hellen Nyamweru** (Kenya)
Rapporteur: Mr. **Uma Panday** (Nepal), World Bank
[Full Concept Note and Programme]
• ***Danilo Antonio*** (Republic of Korea): Land and Property Valuation for Sustainable Urbanization: Findings and Recommendations from East Asia (12975)
[abstract] [handouts]
• **Mahesh Thapa and *Harisharan Nepal*** (Nepal): GIS-based Property Valuation: Lessons Learned from Banepa Municipality (12976)
[abstract] [handouts]
• ***Dong Kyu Kwak*** **and Uri Raich** (USA)**:** The Role of New Technologies in Own-Source Revenue Generation (12977)
[abstract] [handouts]

Friday, 15 November 13:45–15:15 • Regal II, Hotel Yak and Yeti, Kathmandu

TS04A: Safeguarding Land Rights amidst the Impacts of Climate Change and Disasters
Commission: 7
Chair: Mr **Raja Ram Chhatkuli** (Nepal)
Rapporteur: Mr. **Sanjeevan Shrestha** (Nepal)
• ***Flora Kwapena*** (Papua New Guinea): Impact of Customary Land Tenure Systems and Reforms on Women in Papua New Guinea (12874)
[abstract] [paper] [handouts]
• ***Yuri Noyanov*** (Russia): GNSS Data Processing Package to Address Climate Change and Disaster Induced Challenges in Safeguarding Land Rights (12891)
[abstract] [paper] [handouts]
• ***Mahesh Thapa*** (Nepal): A Python Library for Detection of Inconsistencies between Parcel Database and Plot Register (12900)
[abstract] [paper] [handouts]
• ***Raja Ram Chhatkuli***, **Pragya Pradhan**, **Jagat Deuja** (Nepal), **Hellen Ndungu** and **Victor Olonde** (Kenya): Balancing Access to Land for the Landless and Protection of Government and Public Land: The Case of Sustainable Land Management in Nepal (12901)
[abstract] [paper] [handouts]
• ***Dharm Raj Joshi*** and **Tripti Mahaseth** (Nepal): Formalization of Land Rights of Landless and Informal Settlers in Nepal: A Journey Towards Establishing Social Justice (12911)
[abstract] [handouts]
Further Reading:
• ***Dony Erwan Brilianto***, ***Vito Haga Mursa*** and ***Ayu Nadiyariani*** (Indonesia): Collaborative Governance for Safeguarding Land Rights in Indonesia (12881)
[abstract] [paper]
Note: This paper was not presented at the conference.

Friday, 15 November 13:45–15:15 • Platinum Hall, Hotel Yak and Yeti, Kathmandu

TS04B: Partner Spotlights

Chair: Mr. **Mikael Lilje** (Sweden)

Rapporteur: Mr. **Sharad Chandra Mainali** (Nepal)

- ***Subhash Kumar*** (India): CORS for Atmospheric Studies and Disaster Mitigation (12957)
[**abstract**] [**handouts**]
- ***Dong Huang*** (China, PR): SmartEarth 3D Real Scene Product and Service Solution (12971)
[**abstract**] [**handouts**]
- ***Prudence Xu*** (China, PR): Mars Laser RTK – Changer in the World of Surveying and Mapping (12972)
[**abstract**] [**handouts**]

Further Reading:

- ***Luc Groot*** (Netherlands): Digital Transformation in Land Administration: Kadaster's Experiences in the Netherlands and Abroad (12961)
[**abstract**]

Note: This paper was not presented at the conference.

Friday, 15 November 13:45–15:15 • Regal I, Hotel Yak and Yeti, Kathmandu

TS04C Round Table Discussion on Property Valuation and Taxation

Commission: World Bank and 9

Chair: Mr. **Peter R. Ache** (Germany)

Rapporteur: Mr. **Danilo Antonio** (Korea, Republic of)

[**Full Concept Note**]

Part I

Property related decisions under risks and the transparency of markets

Panelists:

1. *Raja Ram Chhatkuli (Nepal) or Hellen Ndungu (Kenya)*
2. *Wolfgang Glunz (Germany)*
3. *Danilo Antonio (South Korea)*

Part II

Towards a vibrant and connected community of property valuers

Panelists:

1. *Prem Badur Chhetri (Bhutan)*
2. *Subash Ghimire (Nepal*
3. *Upuli Perera (Sri Lanka)*
4. *Pranab Ranjan Choudhury (India)*

Friday, 15 November 15:45–17:15 • Regal Ballroom, Hotel Yak and Yeti, Kathmandu

Closing Ceremony

Chair: Mr. **Niraj Manandhar**, Vice President of NICS

[**Call-to-Action Document**]

Closing – Call to action presentation by ***Dr Clarissa Augustinus***, FIG

[**handouts**]

Closing by FIG President ***Dr. Diane Dumashie***

[**handouts**]

APPENDIX 2. PARTICIPANTS' NAMES AND COUNTRIES

Title	Last name, First name	Country
Mr	Abhishek, Abhishek	India
Mr	Acarya, Babu Ram	Nepal
Mr	Acharya, Nirmal	Nepal
Mr	Acharya, Puskar	Nepal
Mr	Acharya, Rajendra	Nepal
Mr	Ache, Peter	Germany
Mr	Adhikari, Ayush	Nepal
Mr	Adhikari, Madhu Sudan	Nepal
Ms	Adhikari, Nisha	Nepal
Mr	Adhikari, Om Bahadur	Nepal
Mr	Adhikari, Shree Krishna	Nepal
Mr	Ahsan, Muhammad Sheraz	Pakistan
Mr	Alherayef, Othman	Saudi Arabia
Mr	Aljuhany, Naif	Saudi Arabia
Ms	Allen, Anna	Australia
Mr	Althawwad, Abdullah	Saudi Arabia
Mr	Andlar, Goran	Croatia
Mr	Ansari, Samsul Haque	Nepal
Mr	Antonio, Danilo	Korea, Republic of
Prof	Aryal, Jagannath	Australia
Mr	Aryal, Bharat Chandra	Nepal
Ms	Aryal, Sumana	Nepal
Dr	Augustinus, Clarissa	Ireland
Ms	Baidar, Tina	Nepal
Mr	Bajracharya, Birendra	Nepal
Ms	Banepali, Asmita	Nepal
Mr	Banjara, Bigyan	Nepal
Mr	Baral, Toya Nath	Nepal
Mr	Basnet, Ram Kumar	Nepal
Mr	Basnet, Sagar	Nepal
Ms	Basnet, Shanti	Nepal
Mr	Bastola, Bishal	Nepal
Mr	Bhandari, Arun	Nepal
Mr	Bhandari, Krishna Prasad	Nepal
Mr	Bhandari, Yadav Bahadur	Nepal
Mr	Bharadwaj, Dipak	Nepal
Mr	Bhatt, Bhagirath	Nepal
Mr	Bhatt, Laxmi Prasad	Nepal
Mr	Bhatt, Shib Raj	Nepal
Mr	Bhatta, Binod	Nepal
Mr	Bhatta, Ganesh Prasad	Nepal
Mr	Bhomi, Arun Kumar	Nepal
Mr	Bhujel, Gokul	Nepal
Mr	Bhusal, Ashok Kumar	Nepal
Ms	Bhusal, Kiran	Nepal
Mr	Bisht, Bhuwan Singh	Nepal
Mr	Bista, Kaji Bahadur	Nepal

Title	Last name, First name	Country
Mr	Bk, Sabin	Nepal
Ms	Bongcac, Mary Julienne Joy	Philippines
Mr	Brock, John	Australia
Mr	Chaudhary, Lekh Bhadur	Nepal
Mr	Chaudhary, Swadesh Raj	Nepal
Mr	Chettri, Prem BDR	Bhutan
Mr	Chhatkuli, Raja Ram	Nepal
Mr	Chhatkuli, Sanjaya	Nepal
Mr	Chhetri, Anish	Nepal
Mr	Choudhury, Pranab Ranjan	India
Prof	Collado, Angel	Spain
Ms	Dahal, Ashmeera	Nepal
Mr	Dahal, Khilanath	Nepal
Mr	Dahal, Lekha Nath	Nepal
Mr	Dahal, Tanka Prasad	Nepal
Mr	Dangol, Susheel	Nepal
Mr	Dawadi, Sharad Chandra	Nepal
Ms	Dem, Chimi	Bhutan
Mr	Deuja, Jagat	Nepal
Mr	Dev, Bishal	Nepal
Mr	Dev, Habendra Prasad	Nepal
Mr	Dev, Krishna Kumar	Nepal
Mr	Devkota, Sundar	Nepal
Mr	Devkota, Sushil	Nepal
Mr	Devkota, Yashoda	Nepal
Mr	Dhakal, Damodar	Nepal
Mr	Dhakal, Rup Narayan	Nepal
Ms	Dhital, Prabha	Nepal
Mr	Dotel, Umang Raj	Nepal
Mr	Dulal, Prakash	Nepal
Dr	Dumashie, Diane	United Kingdom
Mr	Dumre, Vivek	Nepal
Mr	Dutta, Magnu	Nepal
Dr	Dutta, Rishiraj	Thailand
Mr	Duwadi, Prakash	Nepal
Ms	Fang, Junjun	Germany
Ms	Franca, Hexela	Philippines
Ms	Friis-Hansen, Louise	Denmark
Mr	Garcia, Brian	Australia
Mr	Gautam, Aashish	Nepal
Mr	Gautam, Amrit	Nepal
Mr	Gautam, Khim Lal	Nepal
Mr	Gautam, Sudarshan Kumar	Nepal
Mr	Ghimire, Bijay	Nepal
Mr	Ghimire, Gobinda	Nepal
Mr	Ghimire, Kamal	Nepal
Ms	Ghimire, Namuna	Nepal

Title	Last name, First name	Country
Mr	Ghimire, Prakash	Nepal
Mr	Ghimire, Prashant	Nepal
Mr	Ghimire, Roshan Shankar	Nepal
Mr	Ghimire, Shahadev	Nepal
Dr	Ghimire, Subash	Nepal
Mr	Glunz, Wolfgang	Germany
Mr	Gyawali, Rajeev	Nepal
Mr	Gyawali, Ramesh	Nepal
Mr	Gyawali, Sunil	Nepal
Dr	Huang, Dong	Germany
Mr	Humagain, Binod	Nepal
Mr	Ishii, Kenta	Japan
Mr	Jaishi, Buddhi Man	Nepal
Mr	Jati, Raju	Nepal
Mr	Jha, Nagendra	Nepal
Ms	Joshi, Richa	India
Mr	Joshi, Dharm Raj	Nepal
Ms	Joshi, Dipika	Nepal
Mr	Joshi, Janak Raj	Nepal
Mr	Joshi, Prakash	Nepal
Mr	Joshi, Suresh	Nepal
Mr	Kadariya, Subash	Nepal
Mr	Kadel, Rajendra Prasad	Nepal
Mr	Kaizu, Masaru	Japan
Mr	Karki, Maheshwor	Nepal
Mr	Karmacharya, Amrit	Nepal
Mr	Karmacharya, Niroj	Nepal
Mr	Karn, Gireesh	Nepal
Dr	Karna, Bikash Kumar	Nepal
Ms	Kathayat, Chitra Kumari	Nepal
Mr	Kathayat, Kabi Singh	Nepal
Mr	Katuwal, Kapil	Nepal
Dr	Keenan, Ryan	Australia
Mr	Khanal, Rupesh Raj	Nepal
Mr	Khanal, Sujan	Nepal
Mr	Kharel, Bipin	Nepal
Mr	Khatri, Bhim Prakash	Nepal
Mr	Koirala, Madan	Nepal
Mr	Kondrashov, Zakhar	Russian Federation
Ms	Kovalevich, Veronika	Russian Federation
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Mr	Lamsal, Shiva Prasad	Nepal
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Mr	Li, Lin	China, P.R.
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Ms	Maharjan, Sony	Nepal
Ms	Mahaseth, Tripti	Nepal
Mr	Mainali, Sharad Chandra	Nepal
Mr	Malik, Kapil Kumar	India
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Mr	Manandhar, Aman	Nepal
Ms	Manandhar, Monika	Nepal
Mr	Manandhar, Niraj	Nepal
Mr	Manandhar, Sanjaya	Nepal
Mr	Manandhar, Susmina	Nepal
Mr	Marasini, Anil	Nepal
Mr	Maratha, Rajendra Prasad	Nepal
Mr	Mercier, Bertrand	France
Mr	Mishra, Suman Kishor	Nepal
Mr	Mulenda, Sangwa	Congo, D.R.e
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Ms	Ndungu, Hellen	Kenya
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Mr	Nepal, Harisharan	Nepal
Mr	Nepal, Sabin	Nepal
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Mr	Neupane, Dhana Sudhan	Nepal
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Mr	Oli, Punya P	Nepal
Mr	Panday, Uma Shankar	Nepal
Mr	Pandey, Achut Krishna	Nepal
Mr	Pandey, Ganesh	Nepal
Mr	Pandey, Gorakh Nath	Nepal
Mr	Pandey, Hastraj	Nepal
Mr	Pandey, Purna Prasad	Nepal
Mr	Pandey, Yogendra Nath	Nepal
Mr	Pant, Keshab Raj	Nepal
Ms	Pant, Pragya	Nepal
Mr	Pant, Surendra Raj	Nepal
Mr	Panthi, Amrita	Nepal
Mr	Parida, Bhaskar Chandra	India

Title	Last name, First name	Country
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Mr	Paudel, Jagat Raj	Nepal
Ms	Paudel, Rekha	Nepal
Ms	Paudel, Shristi	Nepal
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Ms	Petrushina, Marina	Russian Federation
Mr	Phurba, Phurba	Bhutan
Mr	Pokharel, Shrawan Kumar	Nepal
Mr	Pokhrel, Gangalal	Nepal
Mr	Pokhrel, Girija	Nepal
Mr	Pokhrel, Janak	Nepal
Dr	Poudel, Rewati Raman	Nepal
Mr	Poudel, Sudipta	Nepal
Ms	Poudyal, Rabina	Nepal
Ms	Pradhan, Pragya	Nepal
Mr	Pradhanang, Tirtha Bahadur	Nepal
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Ms	Ranasingha, Geethika	Sri Lanka
Mr	Raut, Sanjeev Kumar	Nepal
Mr	Rawal, Karan Singh	Nepal
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Mr	Regmi, Narayan	Nepal
Mr	Rijal, Ashish	Nepal
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Mr	Sah, Sanjib Kumar	Nepal
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Ms	Sharma, Roshani	Nepal
Mr	Sharma, Uttam	Nepal
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Mr	Shrestha, Ashok Kumar	Nepal
Mr	Shrestha, Bishwambhar Lal	Nepal
Mr	Shrestha, Buddhi Narayan	Nepal
Ms	Shrestha, Dibikshya	Nepal
Ms	Shrestha, Jeny	Nepal
Mr	Shrestha, Manish	Nepal
Mr	Shrestha, Narayan Kumar	Nepal
Ms	Shrestha, Payal	Nepal
Mr	Shrestha, Rabi	Nepal
Ms	Shrestha, Rajita	Nepal
Dr	Shrestha, Reshma	Nepal
Mr	Shrestha, Sanjeevan	Nepal
Mr	Shrestha, Srijal	Nepal
Mr	Shrestha, Sudip	Nepal
Mr	Shrestha, Suresh	Nepal
Mr	Shrestha, Sushan	Nepal
Mr	Sibelik, Hashim	Malaysia
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Mr	Singh, Himanshu	Nepal
Mr	Singh, Robin	Nepal
Mr	Singh Kathayat, Kabi	Nepal
Ms	Singh Shrestha, Shristee	Nepal
Mr	Sinkhada, Pramod	Nepal
Mr	Subedi, Nabaraj	Nepal
Mr	Tenzin, Gonpo	Bhutan
Mr	Thakulla, Ashok	Nepal
Mr	Thakur, Shreeram	Nepal
Mr	Thapa, Bijay Kumar	Nepal
Mr	Thapa, Mahesh	Nepal
Mr	Thapa, Narayan	Nepal
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Mr	Thapa, Raj Kumar	Nepal
Dr	Thapa, Rajesh Bahadur	Nepal
Mr	Thapa, Surendra	Nepal
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Mr	Timilsina, Mandeep Kumar	Nepal
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Ms	Timilsina, Sushmita	Nepal
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Mr	Zangpo, Sonam	Bhutan
Ms	Zhu, Haihong	China, P.R.

APPENDIX 3. CONFERENCE PARTNERS, SUPPORTERS & SPONSORS

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ABOUT AUTHORS

Dr Clarissa Augustinus

- Co-Chair of International Federation of Surveyors Climate Compass Task Force (2023–2026).
- Honorary Ambassador, Federation of International Surveyors (2014-).
- Co-coordinator and co-editor of United Nations Convention to Combat Desertification (2022) Global Land Outlook 2nd Edition on Land Restoration for Recovery and Resilience.
- UN-Habitat, Unit Leader, Land and Global Land Tool Network (GLTN), Urban Legislation, Land and Governance Branch (2003–2015) and lead founder of GLTN.
- Senior lecturer in the Department of Land Surveying in the School of Engineering, Surveying and Construction at the University of KwaZulu Natal (1994–2000).

Ganesh Prasad Bhatta

Mr. Ganesh Prasad Bhatta is a prominent surveying professional from Nepal, deeply engaged in activities of the International Federation of Surveyors (FIG), particularly representing the Nepal Institution of Chartered Surveyors (NICS). He served as the Co-Conference Director of the FIG Regional Conference 2024 and represents NICS as the FIG Representative from Nepal. Additionally, he is an active member of the FIG-SDG Task Force.

Professionally, Mr. Bhatta is a distinguished figure in the surveying profession in Nepal. He is currently the Joint Secretary and Spokesperson for the Ministry of Land Management, Cooperatives, and Poverty Alleviation in the Government of Nepal. With over 25 years of dedicated service in surveying, land administration and public sector leadership, Mr. Bhatta has held several notable leadership positions, including Executive Director of the Land Management Training Center (LMTC), Director General of the Survey Department, and Province Secretary at the Ministry of Physical Infrastructure Development, Sudur Paschim Province. He is committed to leveraging his extensive expertise to drive impactful advancements in Nepal's surveying profession.

Mr. Bhatta earned his M.Sc. in Land Administration from the University of Twente, Faculty of Geo-Information Science and Earth Observation (ITC), Netherlands, in 2010. He is also pursuing a part-time Ph.D. at Kathmandu University, further demonstrating his commitment to academic and professional excellence.

Tina Baidar

Tina Baidar is currently the Chief Survey Officer at the Survey Department under the Ministry of Land Management, Cooperatives and Poverty Alleviation. She leads the Levelling and Gravity Section of the Geodetic Survey Division. With over 9 years of experience at the Survey Department and Land Management Training Center under the Ministry, she has been involved in using geospatial technologies to prepare topographic base maps of Nepal, providing technical support on land use zoning update and implementation programme to local levels, delivering various short-term and long-term trainings programmes in the field of surveying, mapping and geospatial domain, and engaged in research activities.

Ms. Baidar is a Geomatics engineer and holds a Master of Science degree in Geospatial Technologies, as an Erasmus Mundus Scholar. She also holds a Master's degree in Public Administration from Purbanchal University, Nepal. Beyond her professional endeavours, she serves as the Treasurer of the Nepal Remote Sensing and Photogrammetric Society and is a Founding Member of the Nepal Geomatics Engineering Society. Additionally, she contributed significantly as a Secretariat Member of the Local Organising Committee for the FIG Regional Conference 2024.

Sanjeevan Shrestha

Sanjeevan Shrestha currently serves as the Undersecretary at the Ministry of Land Management, Cooperatives, and Poverty Alleviation, where he heads the Land Measurement, Spatial Information, and Land Use Department. Previously, he held the position of Chief Survey Officer at the Survey Department. With over 12 years of experience at the Survey Department and the Land Management Training Center under the Ministry, he has made significant contributions in geodetic survey and capacity-building initiatives. His responsibilities have included leading the Levelling and Gravity Section, planning and monitoring annual geodetic survey activities, coordinating various short- and long-term training programmes, conducting research activities and the annual publication of journals in the geospatial domain.

In addition to his government roles, Mr. Shrestha is the Vice President of the Nepal Remote Sensing and Photogrammetric Society and a Founding Member of the Nepal Geomatics Engineering Society. Besides, he made significant contributions as a member of the Secretariat for the Local Organising Committee of the FIG Regional Conference 2024.

Paula Dijkstra

As the Director of Kadaster International, Paula oversees the coordination of our organisation's global initiatives and international cooperation projects. Kadaster International offers consultancy services to governments worldwide in land administration, geo-information services, e-governance and SDI implementation. Currently I serve as the chair of the FIG task force dedicated to advancing the Sustainable Development Goals. Additionally, I had the honour of being appointed as the co-conference director for the e-Working Week of the International Federation of Surveyors (FIG), which was hosted by the Netherlands. Despite challenges, the event was successfully transitioned to a fully virtual format, delivering a highly effective conference experience in June 2021.

Raja Ram Chhatkuli

Mr Raja Ram Chhatkuli is a National Land Expert and coordinator of land programme at UN- Habitat in Nepal. He previously served as Director General of Survey Department and Joint Secretary at the Ministry of Land Reform and Management, Government of Nepal. He is a Senior Surveyor with post graduate education in Cartography and geoinformation production and Master of Science in geoinformatics from ITC Twente in the Netherlands. Some of his major contributions were in the design and production of topographic base-mapping, database production, and promotion of spatial data infrastructure in Nepal. His present research interests are on issues related to pro-poor and gender-responsive land polices and good land governance.

Hellen Nyamweru-Ndungu

Hellen Ndungu is an urban practitioner based in Nairobi, Kenya. She is a Programme Management Officer at the Global Land Tool Network (GLTN) within the Land, Housing and Shelter Section of UN-Habitat. She has over 12 years of experience in urban and rural land governance issues and has acquired varied experience working on different land management projects in Africa (Kenya, Uganda, DRC, Namibia, South Sudan, and Zambia) and South Asia (Nepal, Philippines, Laos). Her work which she has co-authored with GLTN Partners is published by the United Nations, scientific journals and universities' press. She holds a Master of Arts degree in Social Sector Planning and Management and a Bachelor of Arts degree in Social Work and Social Administration from Makerere University, Uganda.

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The FIG publications are divided into four categories. This should assist members and other users to identify the profile and purpose of the various publications.

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FIG Reports

FIG Reports are technical reports representing the outcomes from scientific meetings and Commission working groups. The reports are approved by the Council and include valuable information on specific topics of relevance to the profession, members and individual surveyors.

FIG Regulations

FIG Regulations include statutes, internal rules and work plans adopted by the FIG organisation.

List of FIG publications

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ABOUT FIG

International Federation of Surveyors is the premier international organisation representing the interests of surveyors worldwide. It is a federation of the national member associations and covers the whole range of professional fields within the global surveying community. It provides an international forum for discussion and development aiming to promote professional practice and standards.

FIG was founded in 1878 in Paris and was first known as the Fédération Internationale des Géomètres (FIG). This has become anglicised to the International Federation of Surveyors (FIG). It is a United Nations and World Bank Group recognised non-government organisation (NGO), representing a membership from 120 plus countries throughout the world, and its aim is to ensure that the disciplines of surveying and all who practise them meet the needs of the markets and communities that they serve.

This publication is based on the FIG Regional Conference on 'Climate responsive land governance and disaster resilience: safeguarding land rights,' held in Kathmandu, Nepal in November, 2024. The theme was chosen to support surveyors and land practioners in addressing some of the most urgent challenges of today. We are in the critical path of the sustainability of the planet because of our work on security of tenure, land governance, geospatial information management, land administration and land management, spatial planning and valuation, BIM and so on.

This publication is more than a record of the event. It is a resource for continued learning and a CALL TO ACTION. We hope it serves as an enduring source of inspiration for advancing climate-responsive land governance and building resilient communities. It should inspire innovative ideas, enduring partnerships, and meaningful progress in the years to come. The plenary sessions were world class and challenged business as usual approaches to land administration, geospatial technology and data approaches in the face of the climate crisis. Climate-resilient land administration and governance is needed and the integration of climate and land administration data to enhance climate and disaster resilience. The technical papers from a region directly impacted by the climate crisis and natural disasters were often cutting edge and world leading.

The CALL TO ACTION was based on the innovative thinking presented. It can provide valuable guidance for governments, professionals, academics and NGOs, both regional and national. Young surveyors particularly have a critical role to play because of the uncertain outlook for the Asian region due to climate change and poorly managed natural disasters. The CALL TO ACTION has already inspired the creation of a regional platform to discuss surveying issues regarding climate and disaster resilience.

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