FROM UNCERTAINTY TO PURPOSE-A FIRST-YEAR STUDENT'S JOURNEY INTO LAND, TECH, AND SUSTAINABILITY

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ABSTRACT

I'm a first-year Mine Surveying student at the University of Johannesburg, and when I started this course, I had no idea the field even existed. Now, I can't imagine doing anything else. This abstract reflects my early journey into land governance and geospatial intelligence-areas I'm still learning about but already deeply interested in. A recent mine visit helped me see how land, data, and technology come together in real-world settings, and how important these tools are for managing resources and planning sustainably. I also had the opportunity to work on a group presentation titled Critical Minerals Reshaping the Mining Industry, which opened my eyes to how global demand for minerals is influencing land use, innovation, and policy. I'm curious about how technologies like digital mapping and satellite data can be made more accessible to everyday people, and how they might support sustainable development and resilience beyond 2030. This is not an expert's view-it's a beginner's perspective, driven by curiosity, growing awareness, and a genuine passion for the future of this field.

1. SUMMARY

English
This paper presents the perspective of a first-year mine surveying student at the University of Johannesburg, reflecting on the discovery of land governance and geospatial intelligence as fields of study. The narrative begins with uncertainty about the discipline and develops into a growing passion for its role in sustainable resource management.

Drawing on experiences such as a mine visit to **Khanye Colliery in Gauteng** and a group presentation on critical minerals, the paper highlights how land, data, and technology intersect in practice. It explores emerging tools like digital mapping and satellite data, emphasizing their potential to become more accessible to communities beyond professional circles.

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The discussion connects these insights to the Sustainable Development Goals, showing how geospatial technologies can support resilience and inclusive development beyond 2030. While not written from an expert's perspective, the paper demonstrates how curiosity, awareness, and lived experience can enrich global conversations about land, technology, and sustainability.

Sesotho (Southern Sotho)
Pampiri ena e hlahisa pono ya moithuti wa selemo sa pele sa ho ithuta *mine surveying* Univesithing ya Johannesburg, e bontshang kamoo a ileng a qala tsamaiso ya mobu le bohlale ba geospatial e le makala a thuto. Pale e qala ka ho se tsebe hantle ka lekala lena, empa e tswela pele ho bontsha tjantjello e ntseng e hola mabapi le karolo ya lona taolong ya lisebelisoa le ntshetsopele e tsitsitseng.

Ho ipapisitswe le liphihlelo tse kang ketelo ya polasi ya merafo ya **Khanye Colliery Gauteng** le tlhahiso ya sehlopha e bitswang *Critical Minerals Reshaping the Mining Industry*, pampiri ena e totobatsa kamoo mobu, data le theknoloji di kopanang kateng tshebetsong. E hlahloba disebediswa tse ntseng di hlaha tse kang *digital mapping* le data ya satellite, e hatisa bokgoni ba tsona ba ho fihlella sechaba ka kakaretso, eseng ditsebi feela.

Puisano e hokahanya dintlha tsena le **Dipheo tsa Ntlafatso e Tsitsitseng (SDGs)**, e bontsha kamoo theknoloji ya geospatial e ka tshehetsang ho tiea le ntshetsopele e kenyeletsang ka mora 2030. Le hoja e sa ngodiswa ka pono ya setsebi, pampiri ena e bontša kamoo tjantjello, tlhokomediso le boiphihlelo ba bophelo bo ka matlafatsang dipuisano tsa lefatshe ka mobu, theknoloji le botsitso.

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2. INTRODUCTION

When I began my studies at the University of Johannesburg, I had never heard of mine surveying. I enrolled with curiosity but little understanding of what the field involved. Today, I cannot imagine doing anything else. Mine surveying has opened my eyes to the powerful intersection of land, data, and technology—and how these tools shape the world around us.

This paper reflects my early journey into land governance and geospatial intelligence. It is not written from the perspective of an expert, but from that of a first-year student discovering the relevance of surveying science to sustainable development.

2.1 BACKGROUND AND CONTEXT

Mine surveying is a discipline that combines measurement, mapping, and analysis to support mining operations and land management. It ensures that resources are extracted responsibly, that safety standards are maintained, and that land use is planned with precision.

Land governance and geospatial intelligence extend this work beyond mines, connecting surveying to broader societal goals. They involve managing land rights, spatial data, and digital technologies to support sustainable development. For a student entering the field, these concepts highlight how technical knowledge can have real-world impact.

2.2 PERSONAL EXPERIENCES

2.2.1 Mine Visit

A recent visit to **Khanye Colliery in Gauteng** gave me a practical view of how surveying supports mining operations. I observed how spatial data is collected, processed, and applied to manage resources. This experience showed me that surveying is not only about measurements—it is about enabling decisions that balance economic growth with environmental responsibility.

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2.2.2 Group Presentation on Critical Minerals

Working on a group presentation titled *Critical Minerals Reshaping the Mining Industry* expanded my perspective. We explored how global demand for minerals influences land use, innovation, and policy. This exercise revealed the interconnectedness of local mining practices with global sustainability challenges.

3. EMERGING TECHNOLOGIES

Digital mapping and satellite data are transforming how we understand land and resources. These tools allow for real-time monitoring, predictive analysis, and inclusive planning. However, they are often limited to professionals and institutions.

I am curious about how these technologies can be made more accessible to everyday people. If communities could use digital maps to plan land use or monitor environmental changes, they could participate more actively in sustainable development.

4. LINK TO SUSTAINABLE DEVELOPMENT GOALS

The Sustainable Development Goals (SDGs) emphasize responsible resource management, climate resilience, and inclusive growth. Mine surveying and geospatial intelligence contribute directly to these goals by:

- Supporting **SDG 7 (Affordable and Clean Energy)** through efficient resource mapping.
- Advancing **SDG 11 (Sustainable Cities and Communities)** via spatial planning.
- Strengthening **SDG 13 (Climate Action)** with data for resilience and adaptation.

My journey demonstrates how even a beginner's perspective can connect technical learning to global priorities.

5. REFLECTIONS AS A BEGINNER

This paper is not written from expertise but from curiosity and growing awareness. As a first-year student, I am still learning the fundamentals of surveying. Yet, I believe that personal narratives can enrich technical discussions. They remind us that behind every dataset and policy are people discovering, questioning, and striving for purpose.

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BIOGRAPHICAL NOTES

Palesa Mokoena is a first-year student in Mine Surveying at the University of Johannesburg. She is interested in land governance, geospatial intelligence, and sustainability. Her academic journey reflects resilience and curiosity, shaped by personal experiences and a commitment to inclusive development. She is also a part of two of the most high and full of learning councils which are the Mining Forum and Mine Survey Council of University of Johannesburg.

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