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| Title of the abstract | Embracing the Future: Creating a Framework for Enhancing M&E Data Collection Using Low Orbit Satellite Technology in Zimbabwe's Livelihoods and Food Security Programs |
| Conference session | □ Stream C. Future Driven Systems and Approaches |
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| Preferred format: | □ Formal presentation (maximum 10 minutes) |
| I will need to apply for bursary support, if selected. | □ Yes |
| Language to be used for presentation | □ English |

**Abstract Text**

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| Effective monitoring and evaluation (M&E) is critical for tracking progress and ensuring accountability of Zimbabwe's national food security programs under the National Development Strategy. However, traditional M&E data collection methods like household surveys face growing challenges around cost, frequency, data quality and timeliness of insights. This study aims to develop an innovative framework for enhancing M&E data collection by leveraging new low-earth orbit (LEO) satellite technology and data analytics capabilities. The significance of this framework is underscored by Zimbabwe's current internet infrastructure limitations, where only 2.6% of the population had access to fixed internet in early 2023, and mobile internet penetration stood at a modest 34.8%. Moreover, the country's internet services are hampered by economic instability, power shortages, and inadequate investment in telecommunications infrastructure. The integration of LEO technology presents a promising solution for enhancing M&E data collection in Zimbabwe's national food security programs. LEO satellite constellations like SpaceX's Starlink can provide high-resolution, real-time Earth observation data at an affordable cost compared to traditional satellite imagery. When integrated with ground-truth data from rural households, this spatial data can offer timely visibility into key food security indicators like crop yields, livestock holdings, climate impacts and market access across geographies. Machine learning models can then be applied to this multi-source data to generate predictive analytics on food insecurity hotspots and inform rapid response. These developments promise to deliver high-speed, low-cost internet access across the nation, particularly benefiting remote and rural areas that are crucial to the country's food security programs. The proposed framework will build on these advancements to enhance real-time data collection, thereby improving the accuracy and timeliness of M&E processes. However, key challenges to be addressed include ensuring data quality and interoperability, building analytical capacity, strengthening community engagement feedback loops, and developing institutional protocols for adoption across government agencies. Insights from this pilot can inform development of a national framework and guidelines for mainstreaming LEO satellite and citizen science data into Zimbabwe's M&E system for evidence-based program adaptation. The proposed LEO satellite analytics approach represents a paradigm shift for more cost-effective, timely and localized monitoring of Zimbabwe's food security programs. It demonstrates innovation in leveraging frontier technologies and community participation for enriching M&E data to drive greater impact from public investments and humanitarian assistance in building resilience against food insecurity. |