Cambodia GeoSpatial Day 2025

18 November 2025

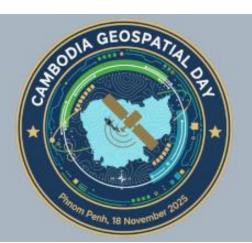
Institute of **T**echnology of **C**ambodia, Phnom Penh











"Leveraging Geospatial Data Analytics for Sustainable Urban Development in Cambodia"

By: Peang Ratana

Founder of STEM Club Cambodia

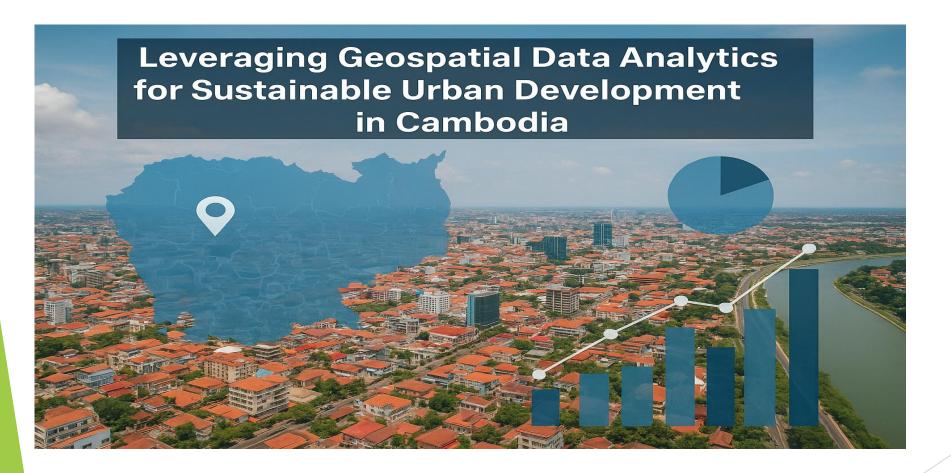
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▶ Title: Leveraging Geospatial Data Analytics for Sustainable Urban Development in Cambodia

Subtitle: Presented by Peang Ratana

Institution/Organization: STEM Club Cambodia

Date: 18 November 2025



Introduction

- ▶ Rapid urbanization in Cambodia, especially in Phnom Penh and Siem Reap.
- Challenges: traffic congestion, land use conflicts, poor waste management.
- ▶ Need for data-driven planning to achieve sustainable development.

What is Geospatial Data Analytics?

- Combines geographic data (maps, satellite images) with analytical models.
- ► Tools: GIS (Geographic Information Systems), Remote Sensing, and Microsoft Power BI.
- Enables visualization and prediction of spatial patterns.

Applications in Urban Development

- ▶ Land-use Planning: Optimize zoning and infrastructure layout.
- ► Transportation: Analyze traffic flow and design smarter routes.
- **Environmental Monitoring:** Track green space and pollution levels.
- ▶ **Disaster Management:** Identify flood-prone areas and plan evacuation routes.

Supporting Sustainable Development Goals (SDGs)

- ► SDG 11: Sustainable Cities and Communities
- Geospatial data supports urban resilience, inclusive growth, and climate adaptation.
- Enables transparent and participatory planning.

Case Examples in Cambodia

- ▶ Phnom Penh Urban Expansion Mapping using satellite imagery.
- ► Tonle Sap Basin Management for water and land use balance.
- ▶ Smart City Initiatives in Siem Reap and Battambang.

Tools and Technologies

- ► GIS Platforms: ArcGIS, QGIS
- ▶ **Remote Sensing:** Sentinel, Landsat imagery
- ▶ **Data Integration:** Power BI, Google Earth Engine
- ► Al & Machine Learning for predictive modeling

Challenges and Opportunities

Content:

A. Challenges:

- Limited technical skills and data infrastructure.
- Data sharing and governance issues.

B. Opportunities:

- Growing digital transformation.
- Capacity building through education and partnerships.

Way Forward

- Strengthen national geospatial data policy.
- Build local expertise through training and education.
- ► Foster collaboration between government, academia, and private sector.

Why integrate QGIS with Power BI?

- You can use QGIS to do tasks that Power BI's map visuals cannot, such as:
- Detailed spatial analysis (buffer, heatmap, clipping, geoprocessing)
- Creating custom shapefiles and vector layers
- High-resolution maps for reporting
- Working with satellite images, elevation data, and raster layers
- Custom map styling for business dashboards

Then bring the processed data to Power BI for:

- Dashboards
- KPI reporting
- Interactive map filters
- Publishing and sharing

Conclusion

- ▶ Geospatial analytics is a *powerful enabler* of sustainable urban growth.
- Integrating data, technology, and policy ensures inclusive progress.
- ▶ Let's use data to shape smarter Cambodian cities.