

# Cambodia GeoSpatial Day 2025

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Institute of Technology of Cambodia, Phnom Penh



## “Leveraging Geospatial Data Analytics for Sustainable Urban Development in Cambodia”

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- **Title:** Leveraging Geospatial Data Analytics for Sustainable Urban Development in Cambodia  
**Subtitle:** Presented by Peang Ratana  
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# Introduction

## Content:

- ▶ 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?

## Content:

- ▶ 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

## Content:

- ▶ **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)

### Content:

- ▶ 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

### Content:

- ▶ **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

### Content:

- ▶ **GIS Platforms:** ArcGIS, QGIS
- ▶ **Remote Sensing:** Sentinel, Landsat imagery
- ▶ **Data Integration:** Power BI, Google Earth Engine
- ▶ **AI & 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

### Content:

- ▶ 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

### Content:

- ▶ 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.*