KOMDIGI
Kementerian Komunikasi dan Digital
Republik Indonesia

Digital Twin Cities: Dari Kota Ke Solusi Permasalahan Perkotaan

Teknologi GeoIntelligence dalam Pengembangan Digital Twin City



Anjar Dimara Sakti

Director of GISACT Geo Intelligence
Center for Remote Sensing
Institut Teknologi Bandung

CRS ITB- GISACT

ABOUT US

Gisact as Innovation Hub of CRS ITB

We are an innovation hub established by the Center for Remote Sensing - Institut Teknologi Bandung (CRS-ITB), dedicated to creating impactful geospatial solutions through collaborative research and development.

NATIONAL & INTERNATIONAL RECOGNITION

CRS ITB Recognized as a Most Productive geospatial research lab in Indonesia (top-tier journals 90+ Q1 Publication)
Indonesia

Winner Maju:ON Hackathon 2025
Korea Embassy, Indonesia

UNDP Data Insight Awards 2025
Osaka, Japan

GEO SDG Awards 2025, The Group on Earth Observation
Rome, Italy



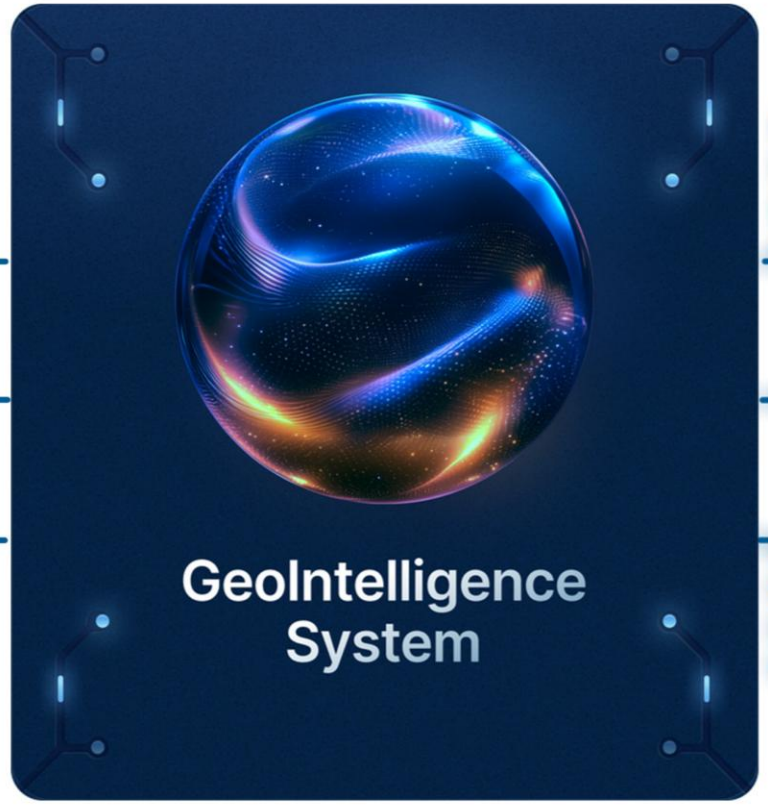
Science and Techno Park (STP) Building, Institut Teknologi Bandung, Bandung City

GISACT

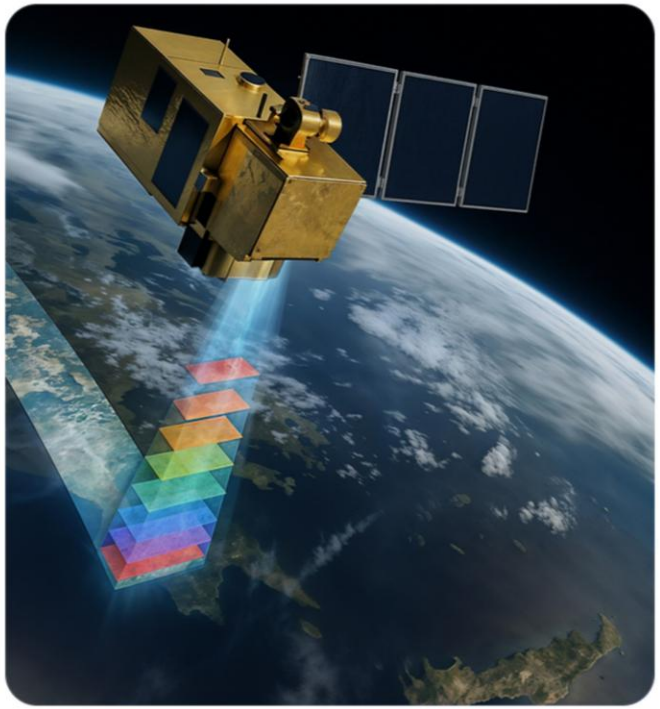
OUR TECHNOLOGY

Next-Gen Decision Support System

- Artificial Intelligence (AI)
- Computer Vision (CV)
- Deep Learning (DL)



- Near Real-time Earth Observation Systems (REOS)
- Advanced Geospatial Decision Support System (GDSS)
- Big Geospatial Data Infrastructure and Intelligence (GDII)





GISACT

Science Behind Our Solution

https://gisact.io/publications

13 *Disaster Mitigation and Resilience*

5 *Assets, Logistics, and Business*

19 *Ecosystem Service and Conservation*

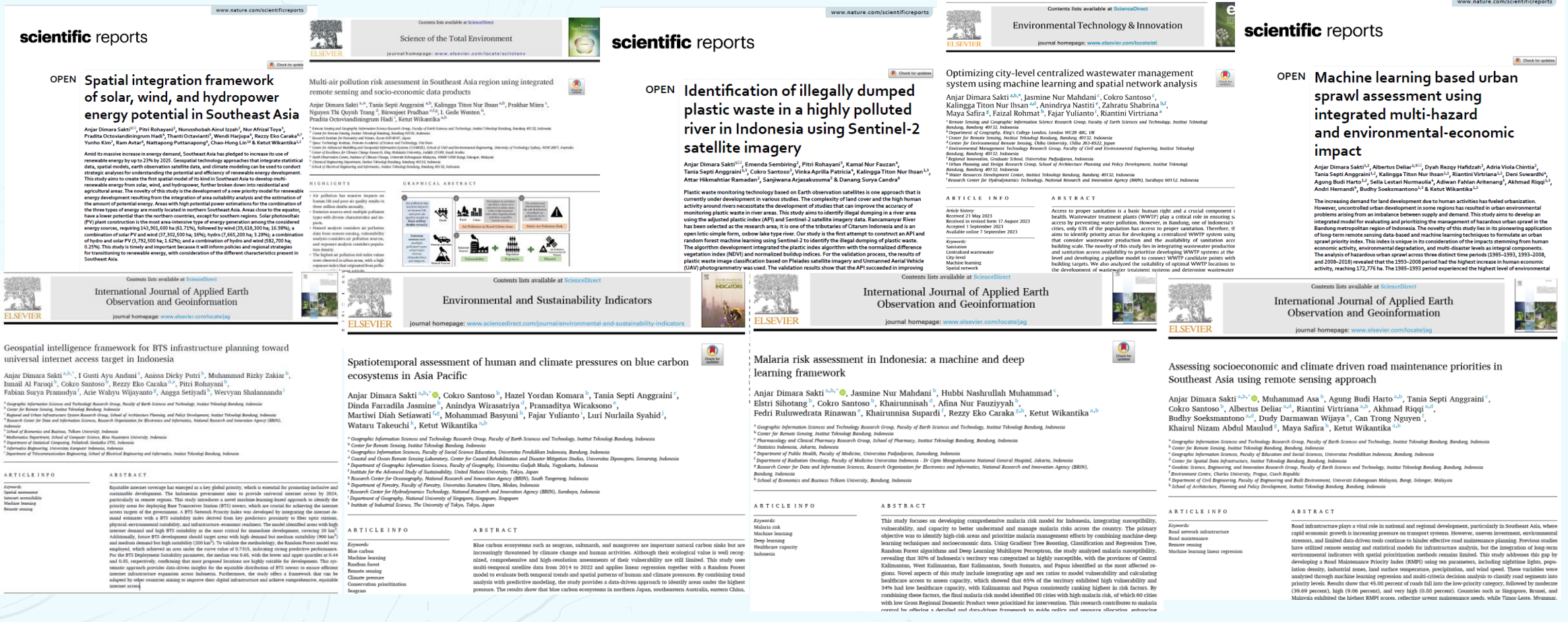
10 *Energy Security and Renewable Energy*

10 *Agriculture and Food Security*

11 *Health and Air Quality*

10 *Urban transport. and Community*

9 *Water Resource, Waste, and Sanitation*



scientific reports

OPEN

Spatial integration framework of solar, wind, and hydropower energy potential in Southeast Asia

Science of the Total Environment

Multi-air pollution risk assessment in Southeast Asia region using integrated remote sensing and socio-economic data products

scientific reports

OPEN

Identification of illegally dumped plastic waste in a highly polluted river in Indonesia using Sentinel-2 satellite imagery

Environmental Technology & Innovation

Optimizing city-level centralized wastewater management system using machine learning and spatial network analysis

scientific reports

OPEN

Machine learning based urban sprawl assessment using integrated multi-hazard and environmental-economic impact

International Journal of Applied Earth Observation and Geoinformation

Geospatial intelligence framework for BTS infrastructure planning toward universal internet access target in Indonesia

Environmental and Sustainability Indicators

Spatiotemporal assessment of human and climate pressures on blue carbon ecosystems in Asia Pacific

International Journal of Applied Earth Observation and Geoinformation

Malaria risk assessment in Indonesia: a machine and deep learning framework

International Journal of Applied Earth Observation and Geoinformation

Assessing socioeconomic and climate driven road maintenance priorities in Southeast Asia using remote sensing approach

GALVIS

Geospatial Intelligence Virtual Assistant System

Near Real-Time Monitoring System

We **continuously collect and process** multi-source satellite data to detect changes as they happen. No more waiting for reports.

Decision Support System

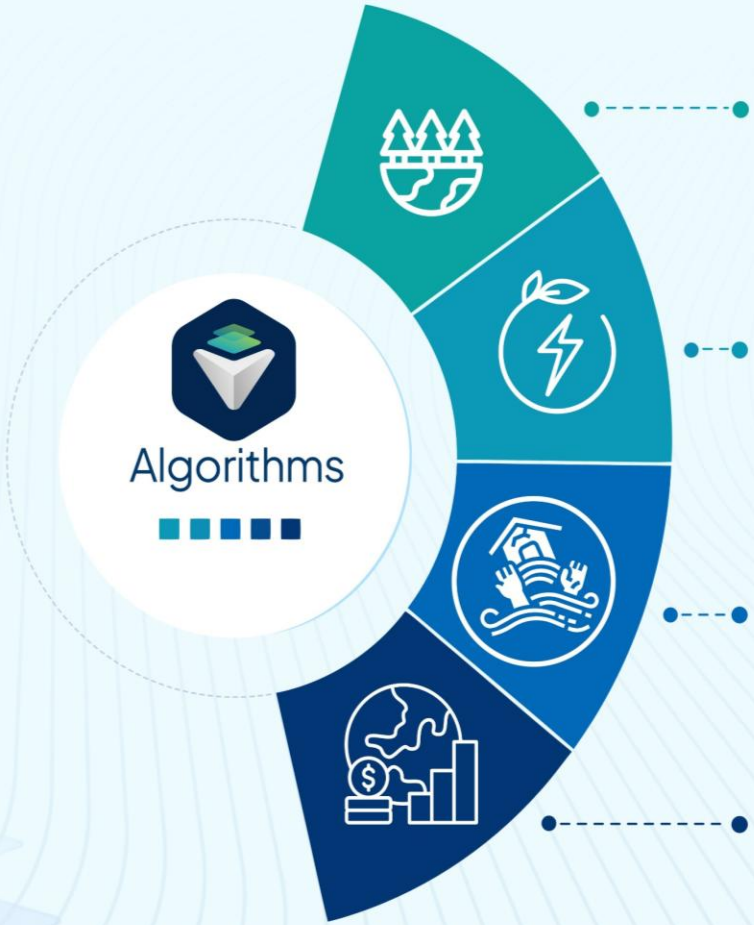
A data-driven system that **helps users analyze conditions, compare decision options**, and **choose the best action** with greater confidence.

AI-Powered Data and Algorithms

AI that **automates complex data processing**, combining deep learning with custom-built algorithms to deliver faster, more accurate, and reliable results.

AI Analytics Assistant

Our AI turns complex geospatial data into **clear insights, and recommendations** you can act on, in near real time.



Vegetation Growth Estimation and Prediction

Predicting and optimizing ecosystem service productivity.

Renewable energy potential algoritm

Solar, wind, hydropower and biomass calculation

Geohazard Modeling Algorithm

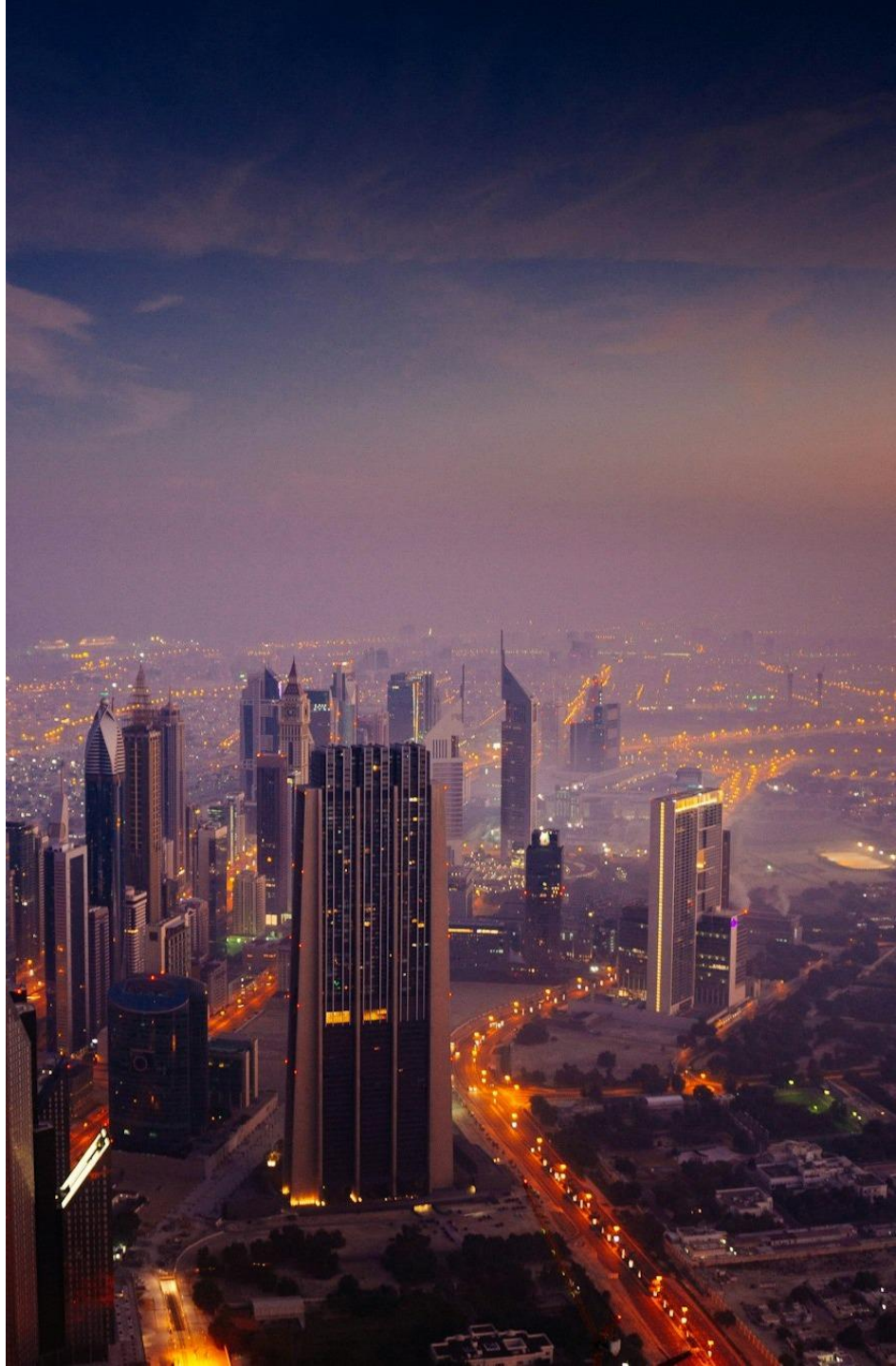
Models hazard susceptibility and risk to support monitoring and mitigation

Economic Modeling Algorithm

Estimates costs, economic value, and market potential to support investment decisions

Digital Twin City

Kota yang bekerja dengan data,
dari tingkat kota sampai bangunan



Digital Twin Cities

A data-driven approach for smarter and more livable cities

Definition

A Digital Twin City is a **virtual representation of a real city or urban system,** connected to physical-world data in (near) real time, to enable visualization, analysis, simulation, and decision support for more effective, data-driven urban planning and management.

Reference definition

ISO/IEC 30173:2023 defines a smart-city digital twin as a digital twin used to develop strategies and achieve city goals through simulation and to increase the visibility of human–infrastructure–strategy interactions.

How It Works

Data Collection
Integrate multi-source data (e.g., GIS, IoT, BIM, traffic, environment, socio-economic).

→

3D/Virtual Model
Build a dynamic 3D/4D city model representing the real urban system.

→

Simulation & Analysis
Test scenarios (e.g., mobility, flood risk, energy, land use) and evaluate impacts.

→

Decision Support
Provide evidence-based insights for planning, policy, and real-time urban management.

International References



Singapore – Virtual Singapore

- National scale 3D digital twin for urban planning and simulation.
- Supports planning, environmental analysis, and citizen engagement.



Seoul, South Korea – S-Map

- City-scale 3D digital twin for urban simulation (e.g., wind, fire spread, air quality).
- Used for planning and emergency response.



Helsinki, Finland – Helsinki 3D

- Open 3D city model as a digital twin.
- Supports participatory planning and various urban analysis (e.g., solar potential, mobility).



Barcelona, Spain

- Urban digital twin to test accessibility and 15-minute-city scenarios.
- Used for evidence-based policy and public services.

Indonesia



IKN Nusantara

- Digital twin (3D virtual replica) for smart city planning and future infrastructure.
- Integrates spatial, environmental, and infrastructure data.
- Used for scenario analysis and evidence-based decision-making.



Jakarta

- Development of Jakarta Satu (JAKI) and 3D city model for urban management.
- Supports flood monitoring, spatial planning, and public services.
- Part of the national push for data-driven and resilient cities.

Key Takeaway

A Digital Twin City is more than a 3D map.
It becomes valuable when the digital model is **connected to real data and used to test scenarios** before decisions are implemented, leading to more efficient, resilient, and livable cities.

Selected Sources

- ISO/IEC 30173:2023. Smart cities — Digital twin — Concepts and terminology.
- ITU-T Y.4600:2022. Smart cities and communities — Digital twin.
- World Economic Forum. 2022. Digital Twin Cities: Framework and Global Practices.
- Singapore GovTech. Virtual Singapore.
- Seoul Metropolitan Government. S-Map.
- City of Helsinki. Helsinki 3D.
- Barcelona City Council. Urban Digital Twin.
- Otorita IKN. Indonesia Smart City Blueprint.

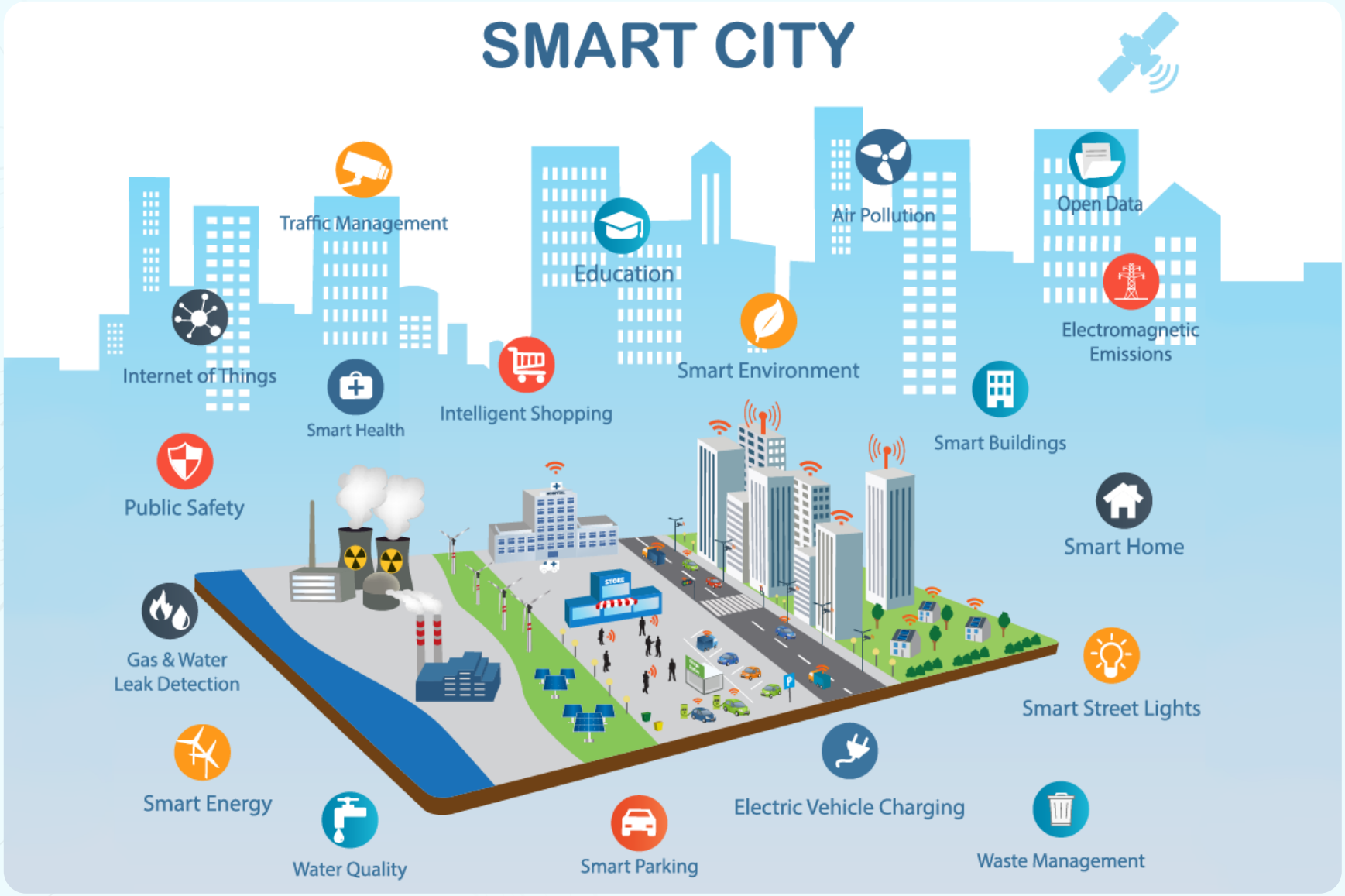
Smart City: Kota yang Bekerja dengan Data

Smart City

Kota yang memadukan teknologi, data, dan partisipasi warga agar layanan publik lebih cepat, tepat sasaran, dan berkelanjutan.

Setiap komponen, dari lalu lintas, energi, sampah, sampai kesehatan, bergantung pada data yang berlokasi.

Kuncinya bukan memasang teknologi, tetapi keputusan yang lebih baik karena datanya lengkap, terhubung, dan mutakhir.



Data Spasial: Ragam Data untuk Smart City

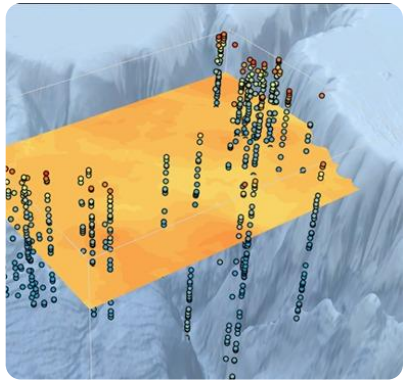
1 Statistik tabular

Indikator per wilayah



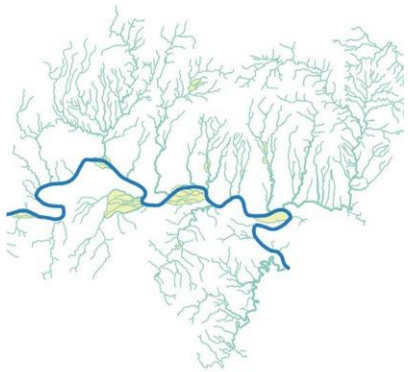
2 Vektor titik

Lokasi pengukuran, survei



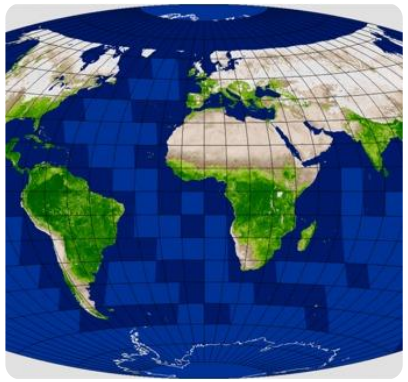
3 Vektor garis

Sungai, jalan, utilitas



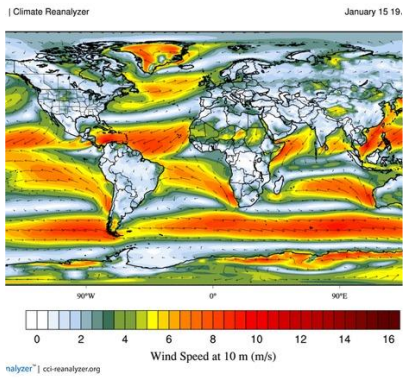
4 Penginderaan jauh

Citra satelit, indeks vegetasi



5 Model numerik

Reanalisis iklim, angin, arus



6 CCTV

Arus lalu lintas, keramaian, kejadian



7 Sensor IoT

Udara, cuaca, muka air, waktu nyata



8 Drone dan LiDAR

Foto udara detail, model 3D kota



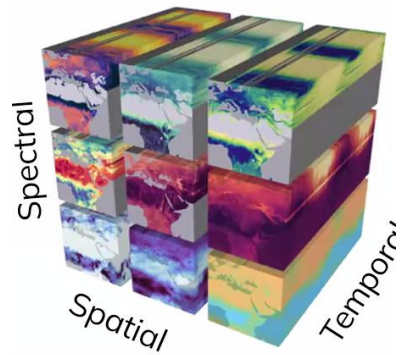
9 Data mobilitas

Pergerakan orang dan kendaraan (GPS, ponsel)



10 Integrasi data

Kubus spasial, spektral, temporal



Digital Twin sebagai Salah satu core Smart City

Mengapa geospasial menjadi inti?

Lokasi sebagai kunci bersama

Data lintas instansi dalam Satu Data bertemu pada satu koordinat.

Analisis sampai tingkat bangunan

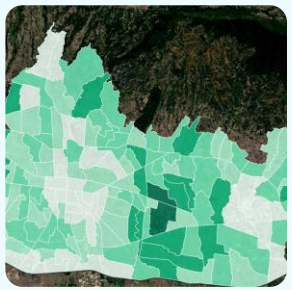
Model 3D membuka analisis naungan, energi, dan risiko per bangunan.

Diperbarui mendekati waktu nyata

Himawari-9 dan sensor memperbarui kondisi kota setiap 10 menit.



Citra satelit



Sosial-ekonomi



Jaringan jalan



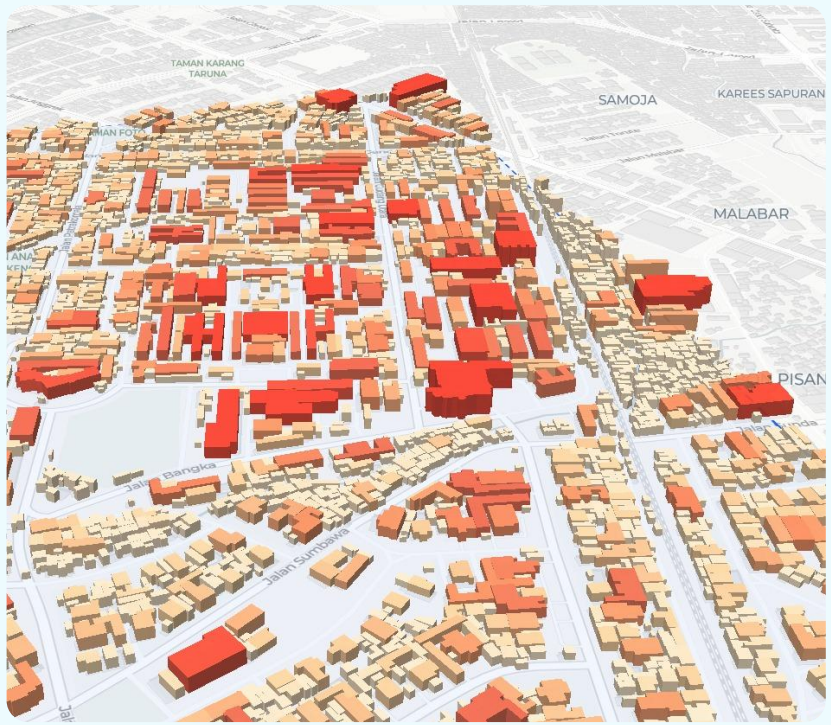
Risiko genangan



Footprint bangunan



Bangunan 3D kota



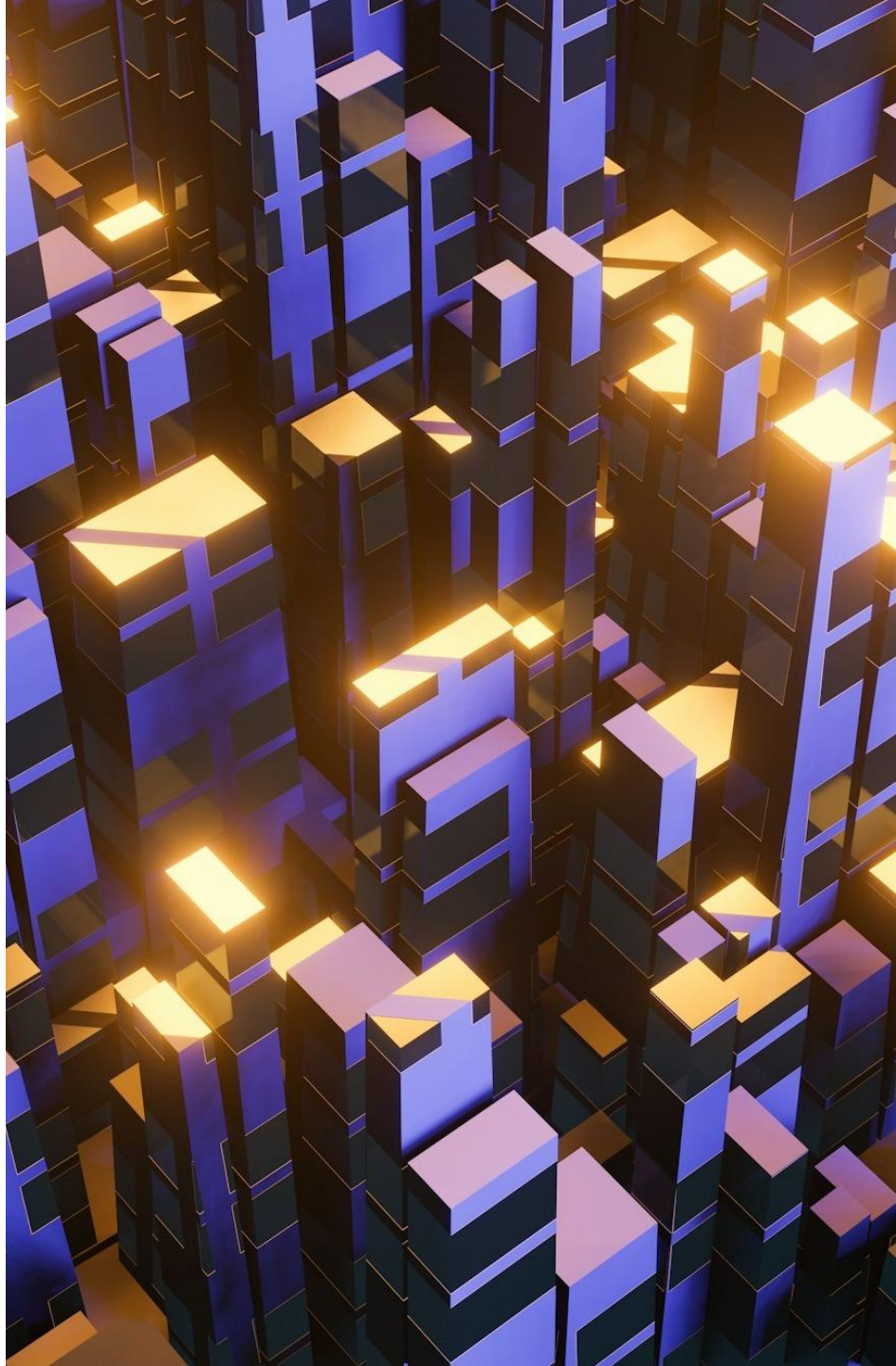
Satu peta terintegrasi

Seluruh lapisan bertemu pada bangunan yang sama, sehingga kebijakan energi, mobilitas, dan kebencanaan dapat diarahkan per bangunan.

Mendukung SDG 7, SDG 11, dan SDG 13

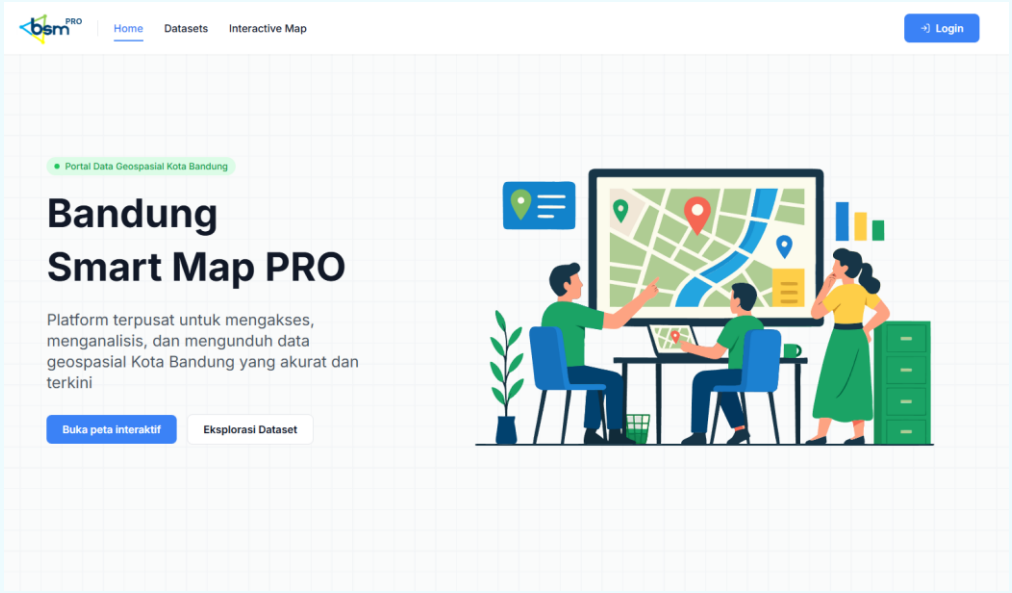
Studi Kasus

Platform GeoIntelligence untuk energi, mobilitas, kota 3D, dan laut

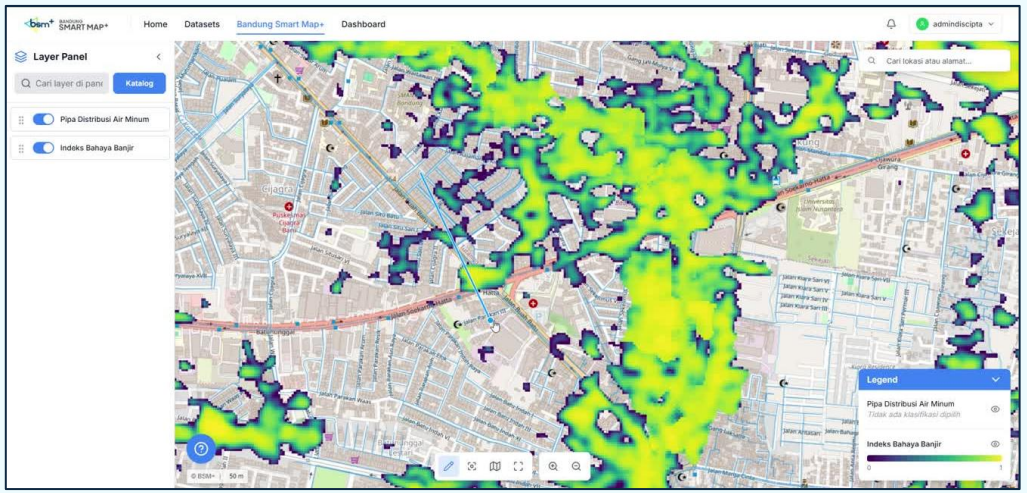


BSM Pro Kota Bandung

https://bsm.bandung.go.id/

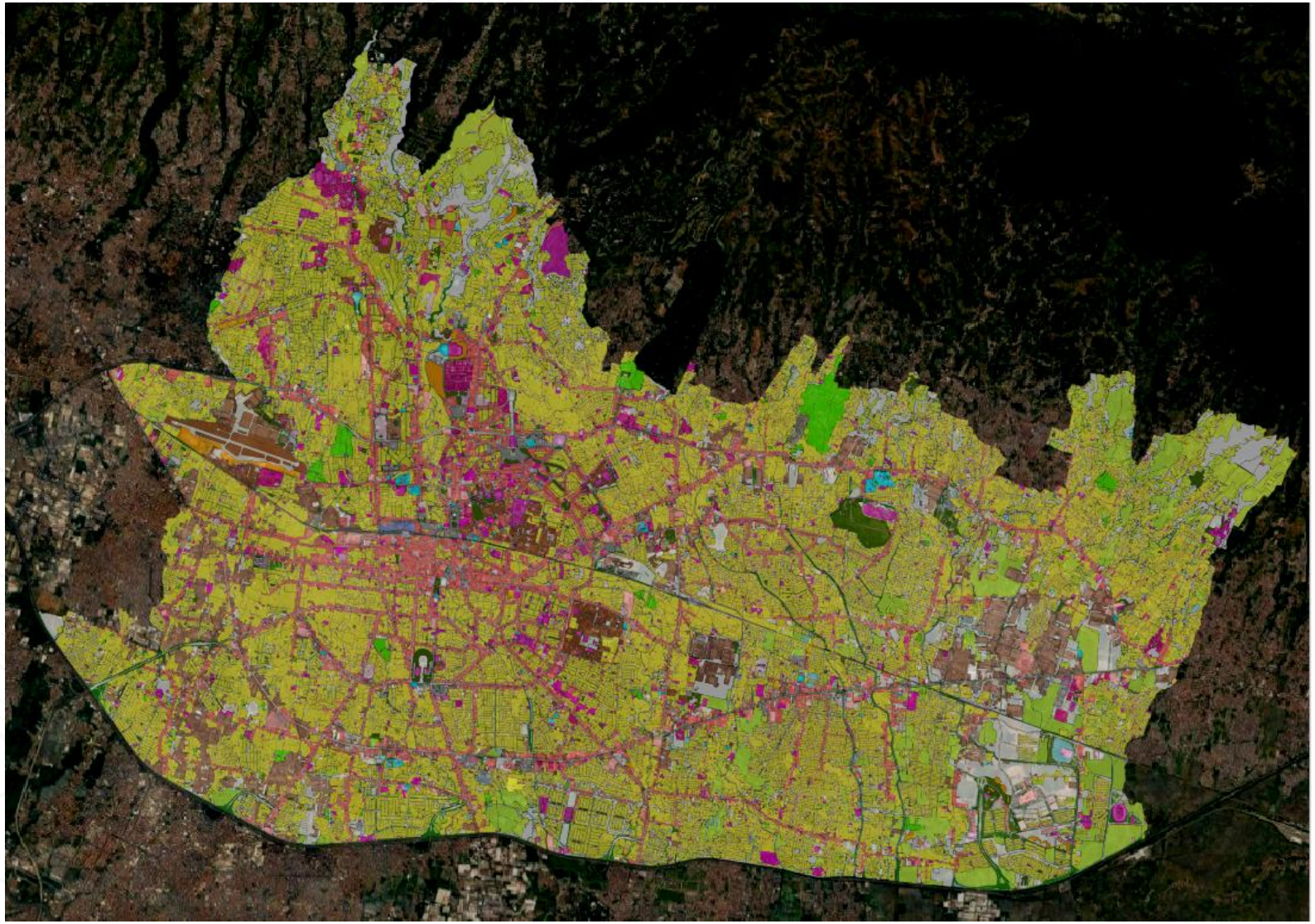








Pemutakhiran Penggunaan Lahan Kota Bandung 2026



151 Kelurahan

38/38 Kelas Penggunaan Lahan Eksisting dan ***Multi Data Source***

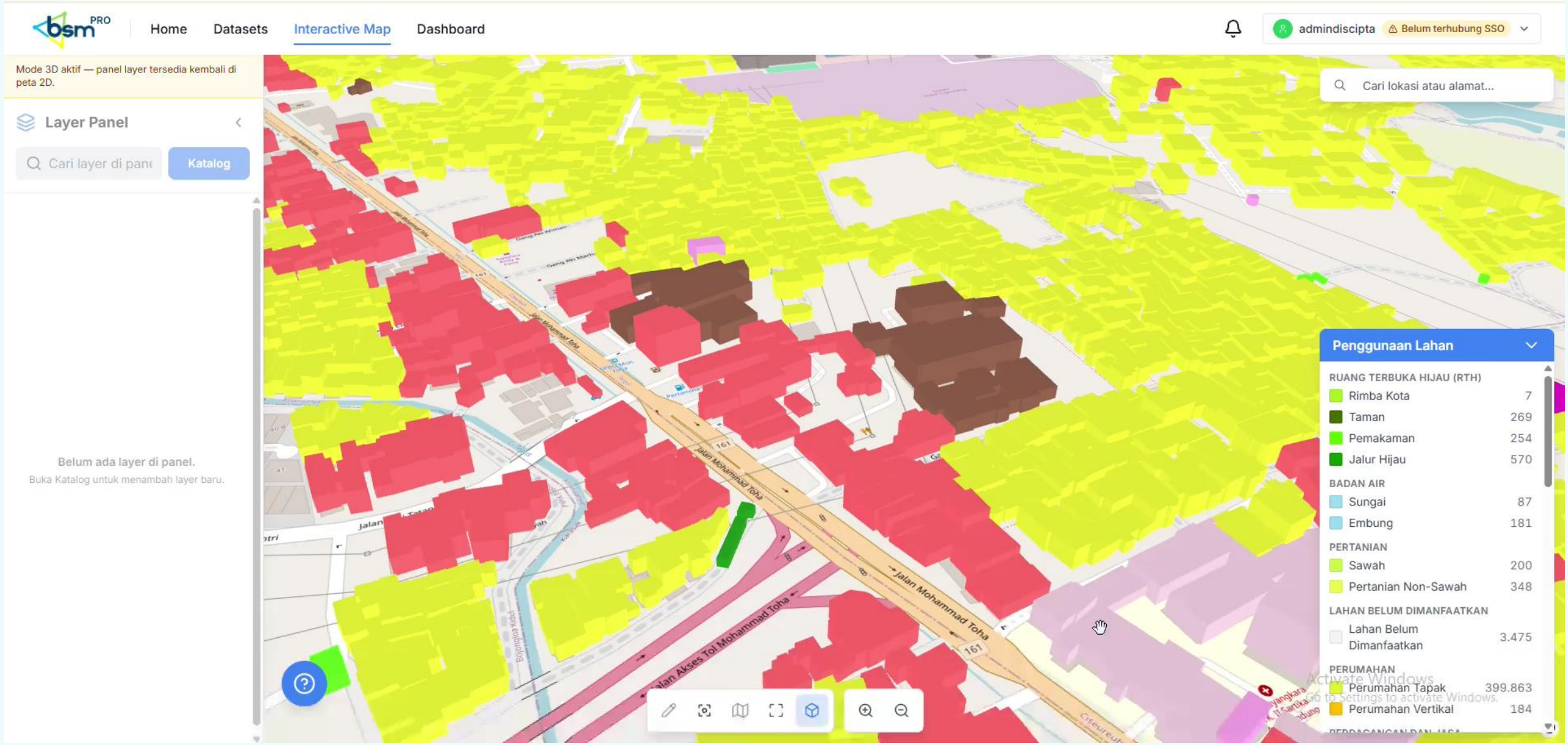


Feature baseline RDTR: 31.773

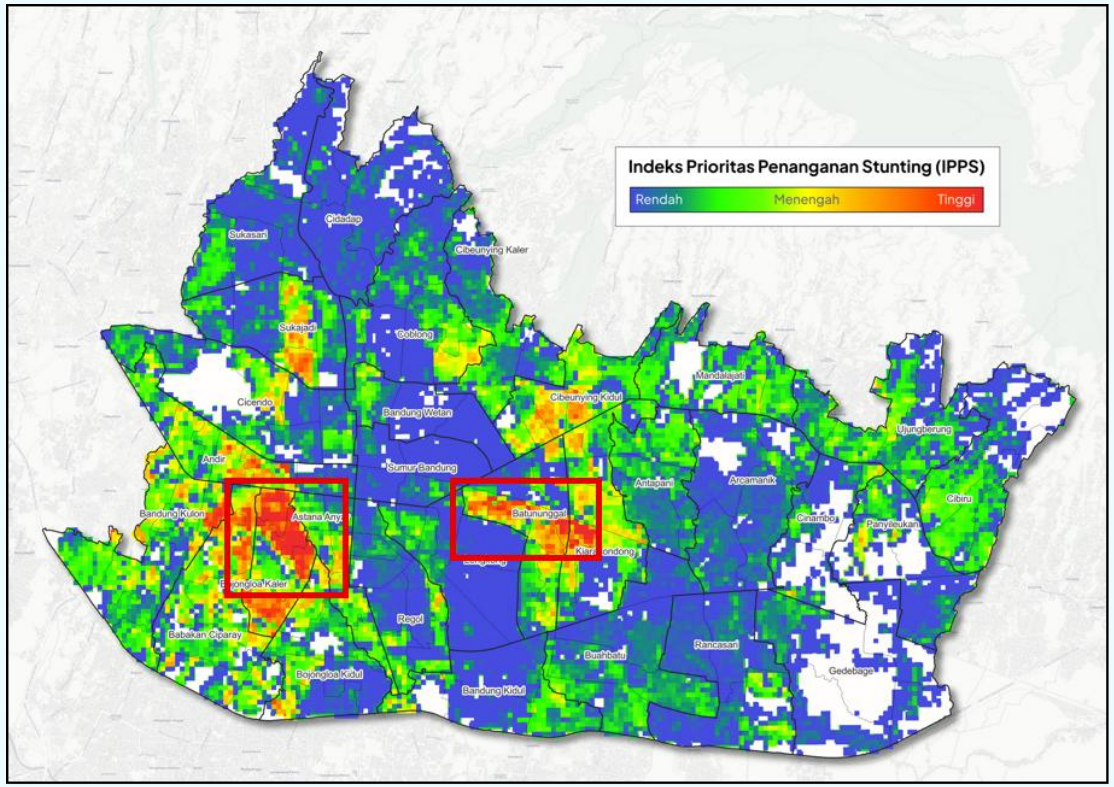
Feature setelah dilakukan pemutakhiran PL: 39.122

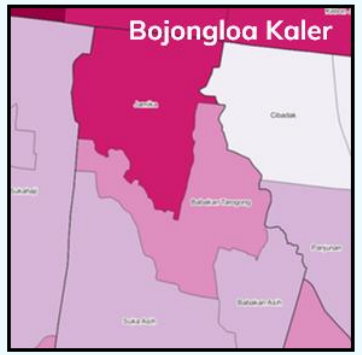
Penambahan 7349 Feature

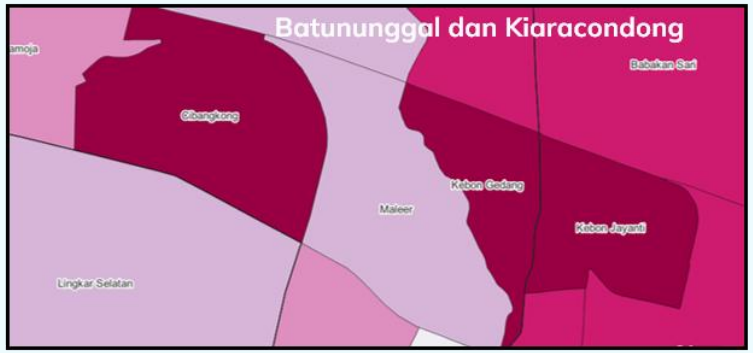
Implementasi BSM Pro pada Pemanfaatan Tata Ruang

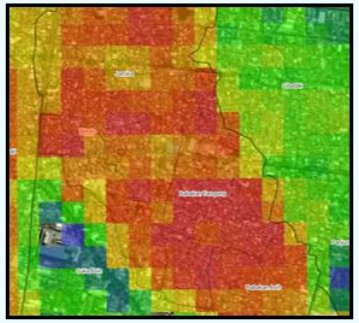


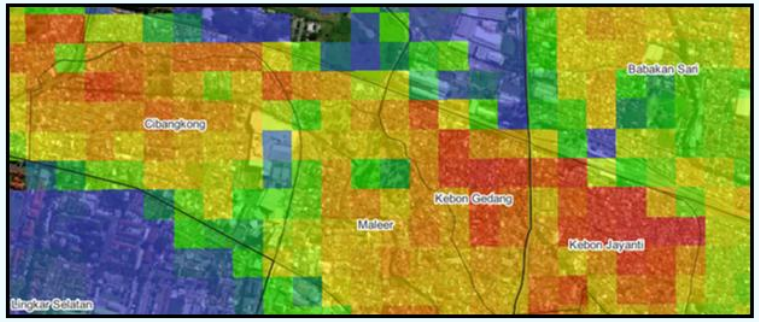
Kemiskinan – Stunting Grid: Peningkatan nilai data



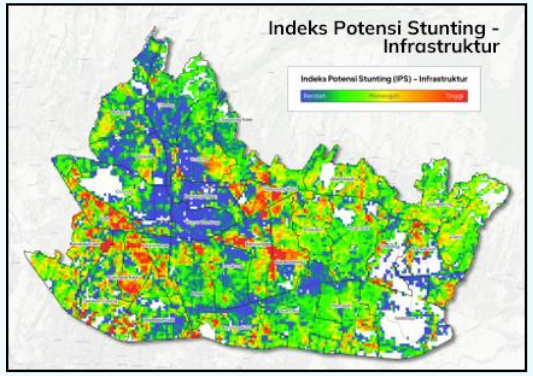


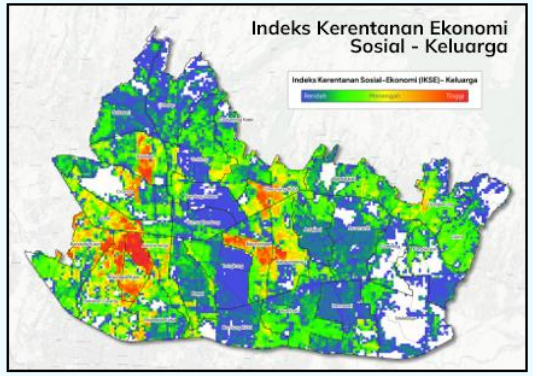


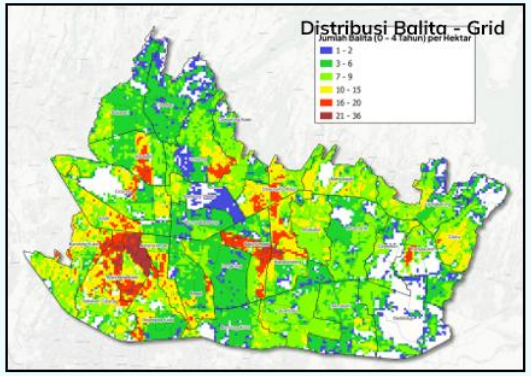




Validasi data pada wilayah **Bojongloa Kaler, Batununggal,** dan **Kiaracondong** menunjukkan konsistensi antara IPPS dengan prevalensi stunting





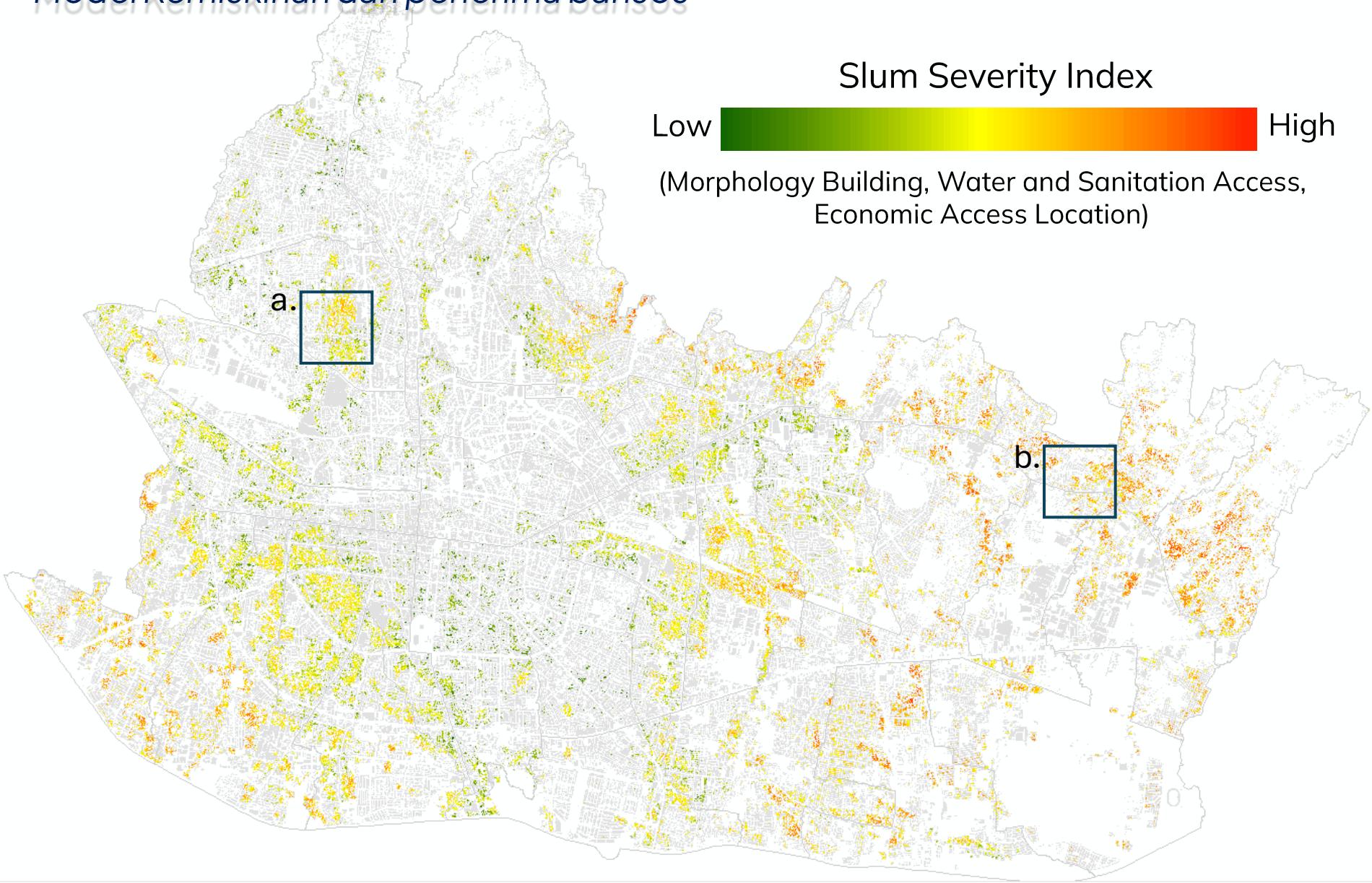


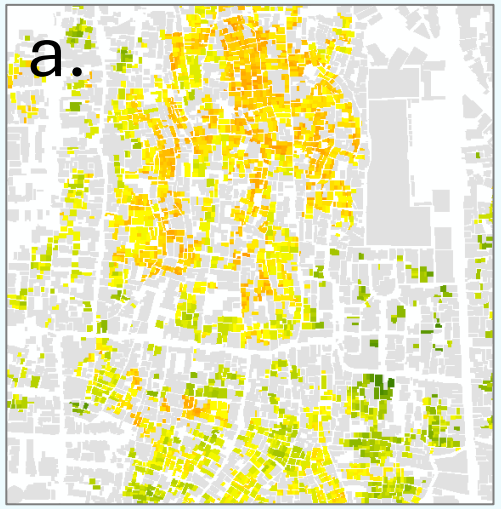
Dari **151 kelurahan** di Kota Bandung, dapat dikerucutkan menjadi **6 kelurahan prioritas penangangan stunting**, yakni:

- Jamika,
- Babakan Tarogong,
- Babakan Asih,
- Cibangkong,
- Kebon Gedang,
- Kebon Jayanti.

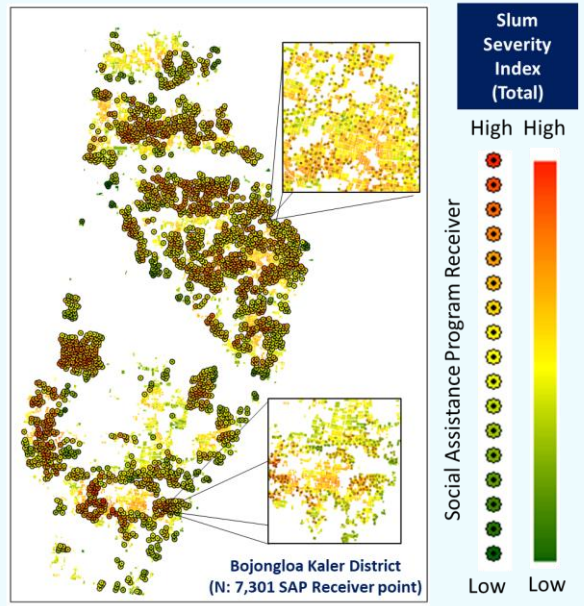
Optimalisasi Jaringan Penyangga Sosial

Model Kemiskinan dan penerima bansos



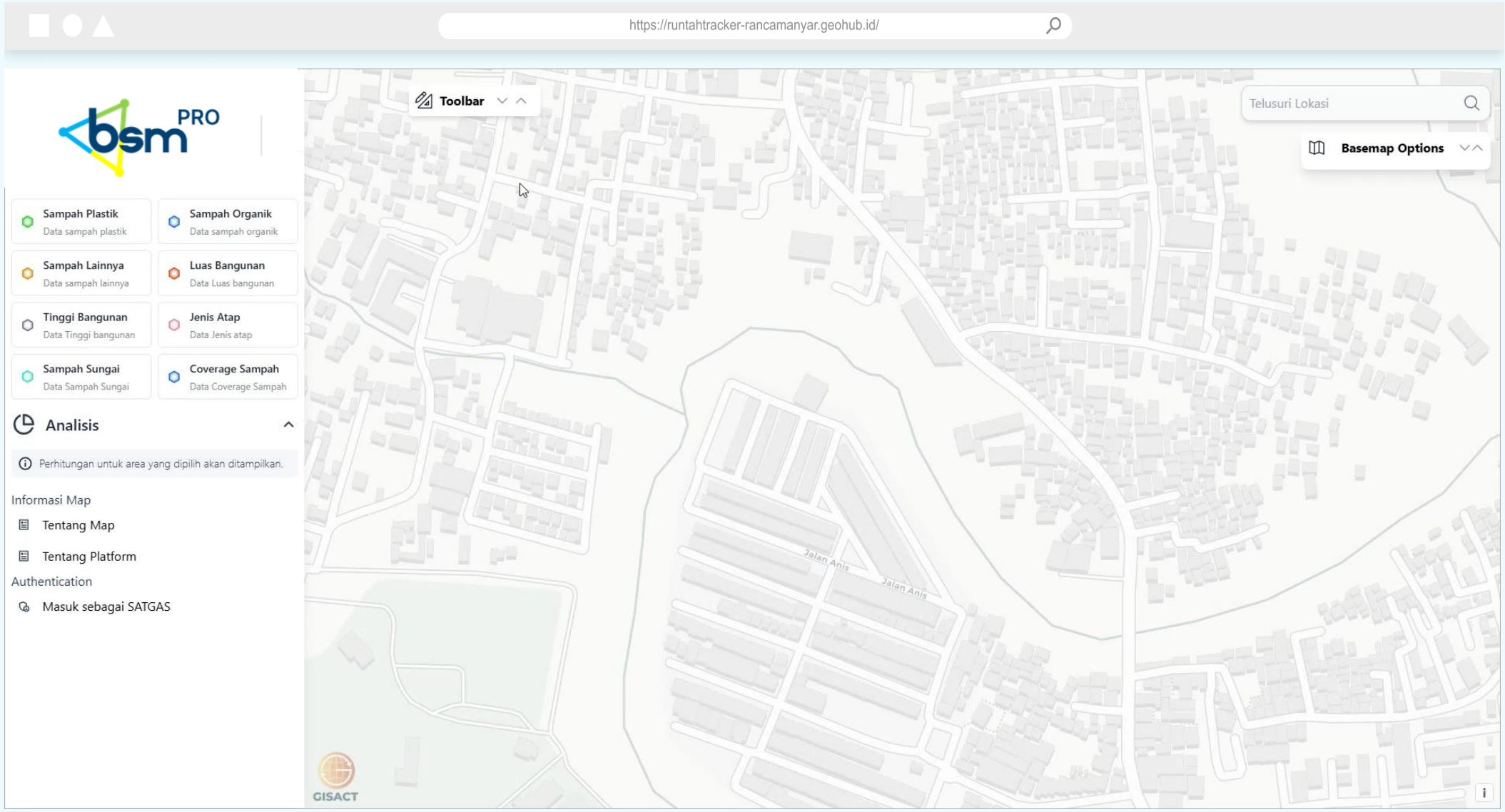


(Morphology Building, Water and Sanitation Access, Economic Access Location)



Geospatial Intelligence Decision Support System

For specific building intervention

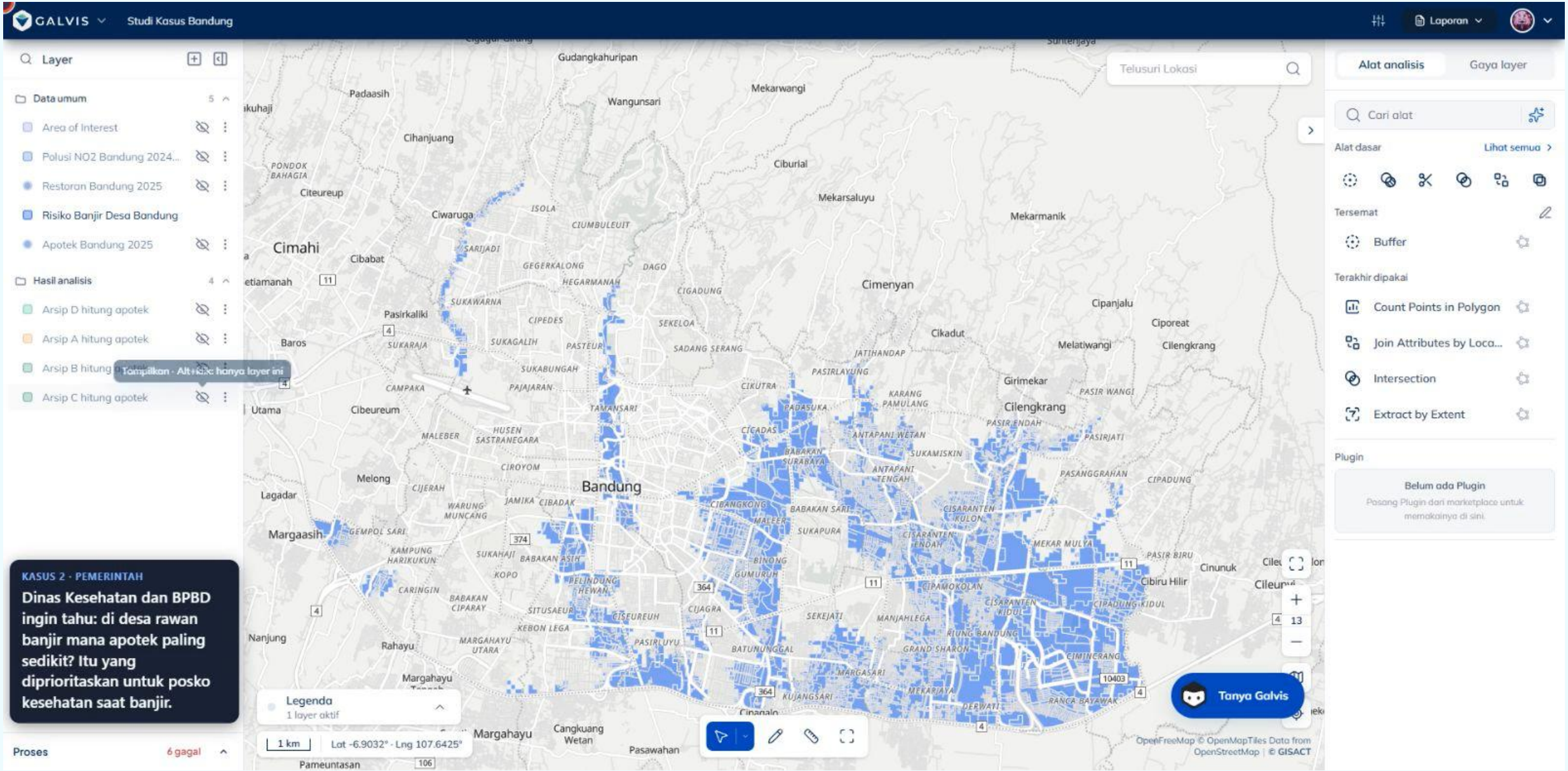


Real-time Earth Observation Systems (REOS)

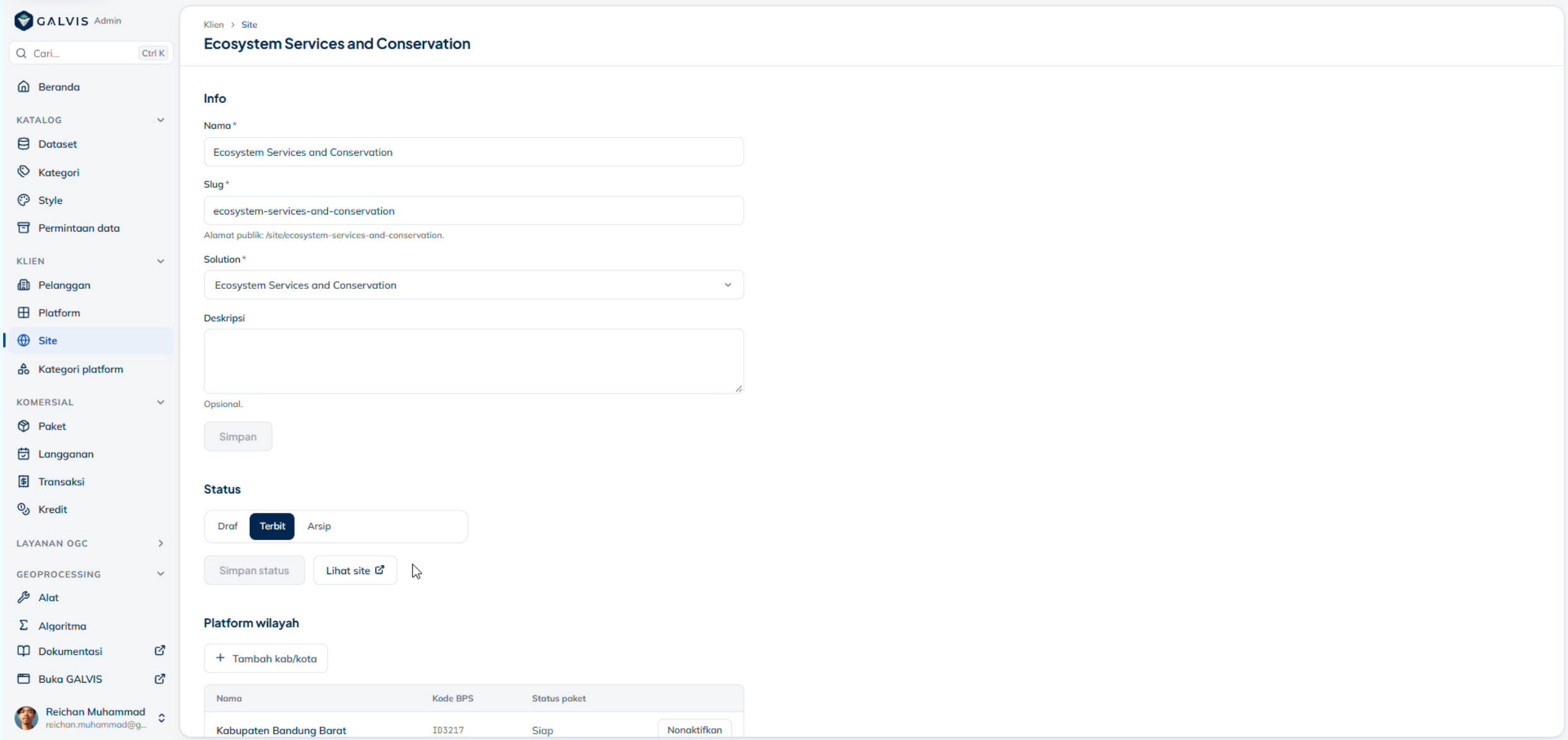
Big Geospatial Data Infrastructure and Intelligence (GDII)

Advanced Geospatial Decision Support System (GDSS)

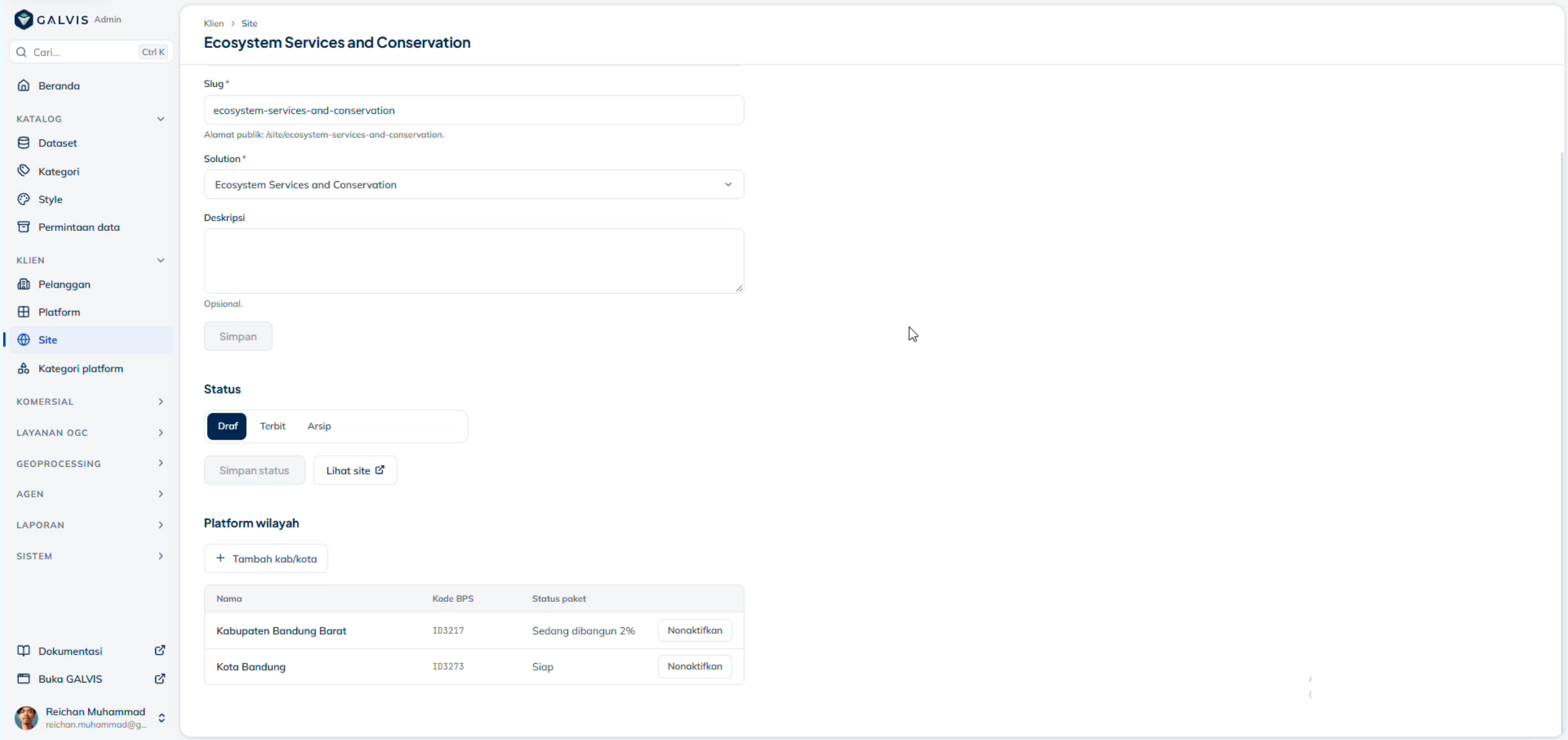
Geospatial Intelligence Decision Support System



Daya Dukung Daya Tampung Lingkungan –Bandung Raya



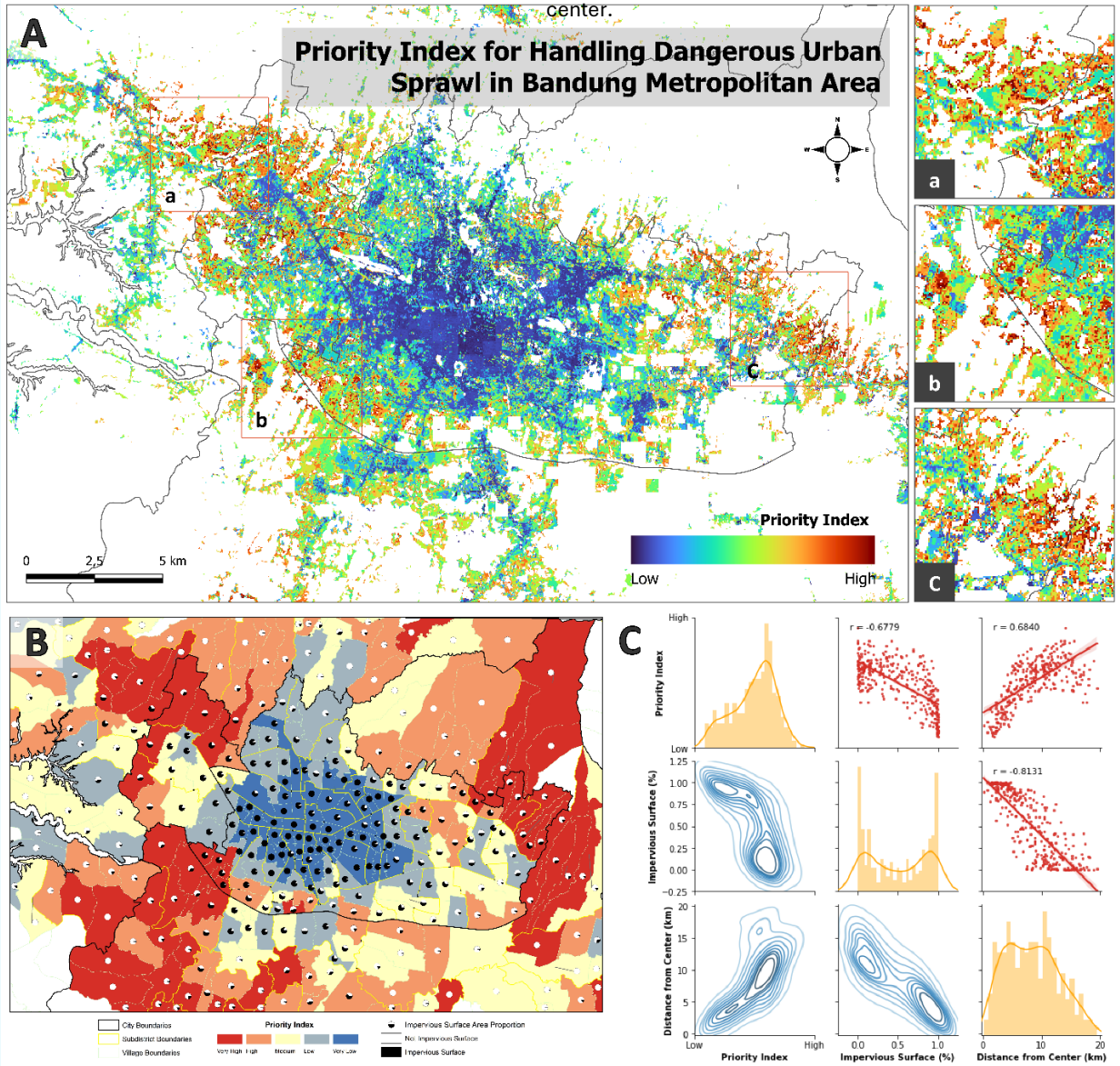
Daya Dukung Daya Tampung Lingkungan –Bandung Raya



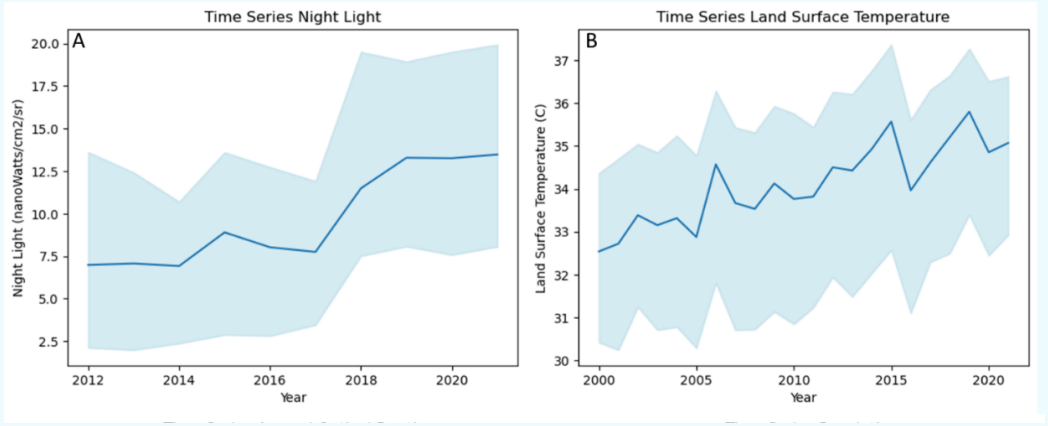
Machine learning based urban sprawl assessment using integrated multi-hazard and environmental-economic impact

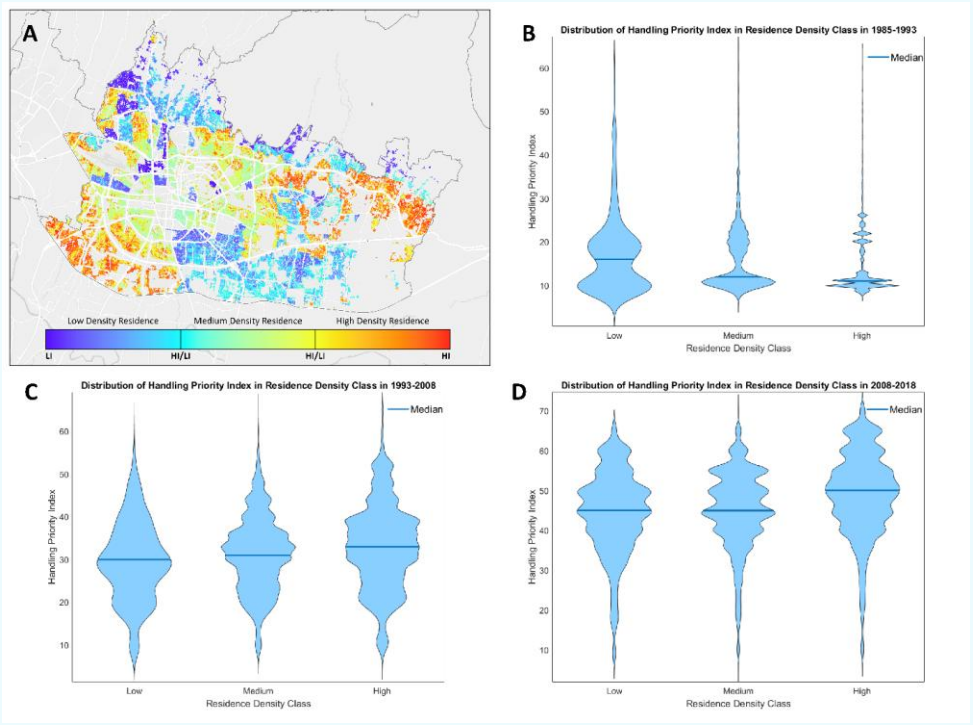
https://doi.org/10.1038/s41598-024-62001-6

(**A**) Priority index product for managing hazardous urban sprawl, (**B**) priority index for managing sub-district urban sprawl, and (**C**) pair grid graph depicting the relationship between the priority index, impervious surface, and distance from the center.



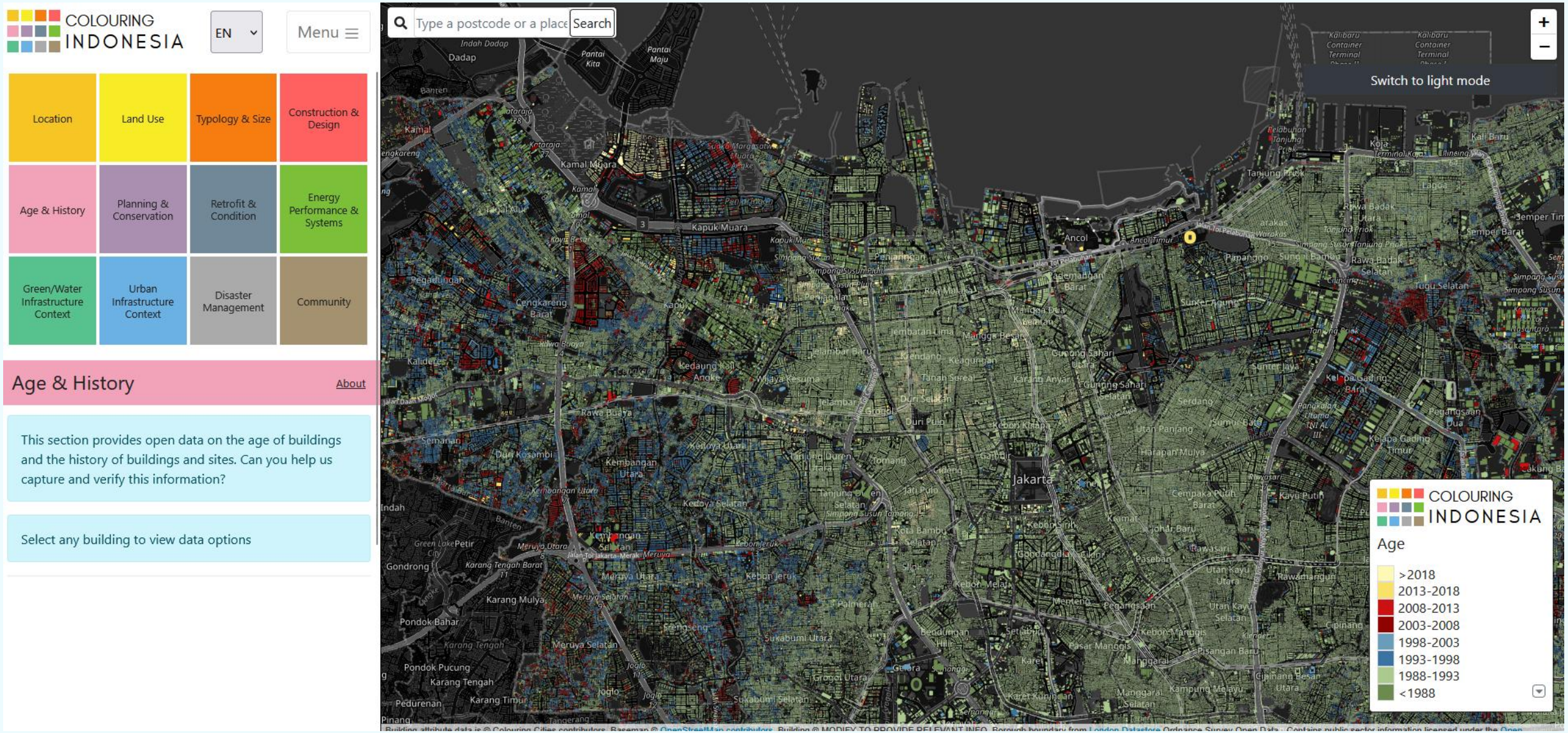
Time series distributions of the indicators: (**A**) nighttime lights, (**B**) surface temperatures,



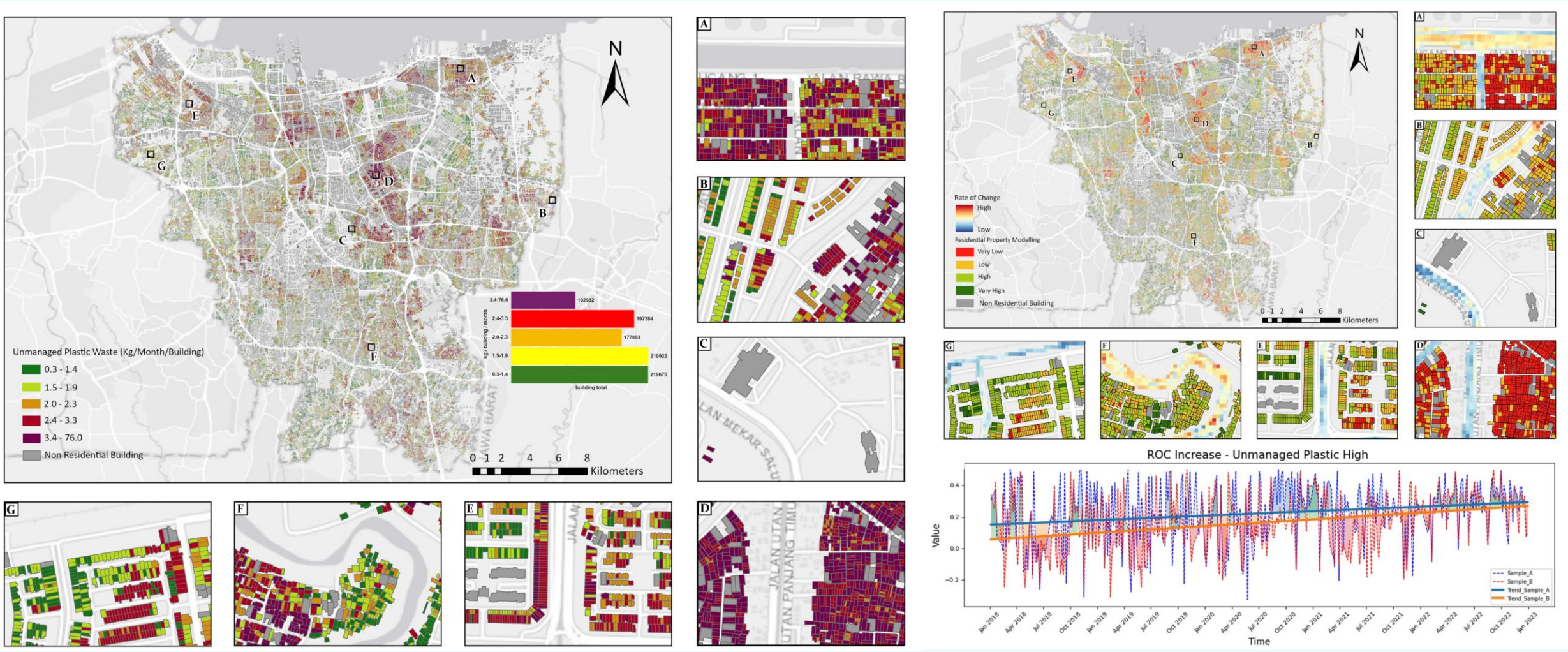


Coloring Indonesia Project

1,6 million building processed using ensemble machine learning

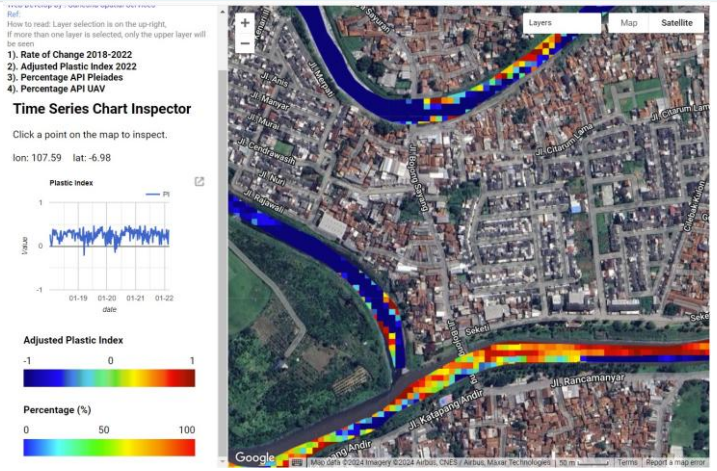


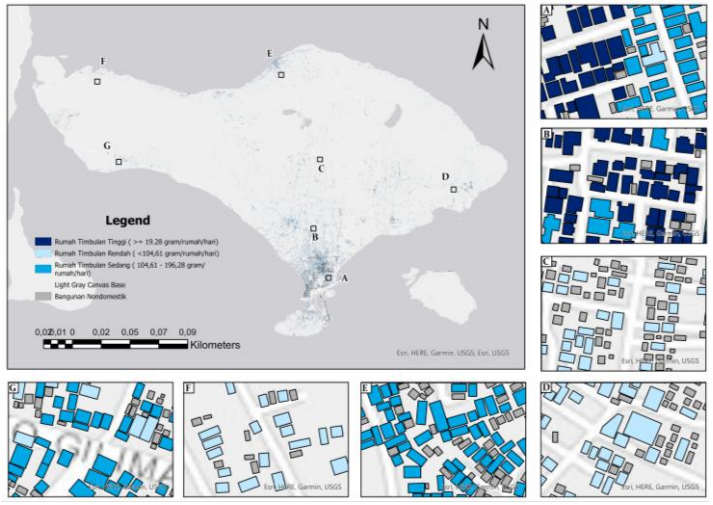
Persampahan: Analisis Kebocoran Sampah Jakarta

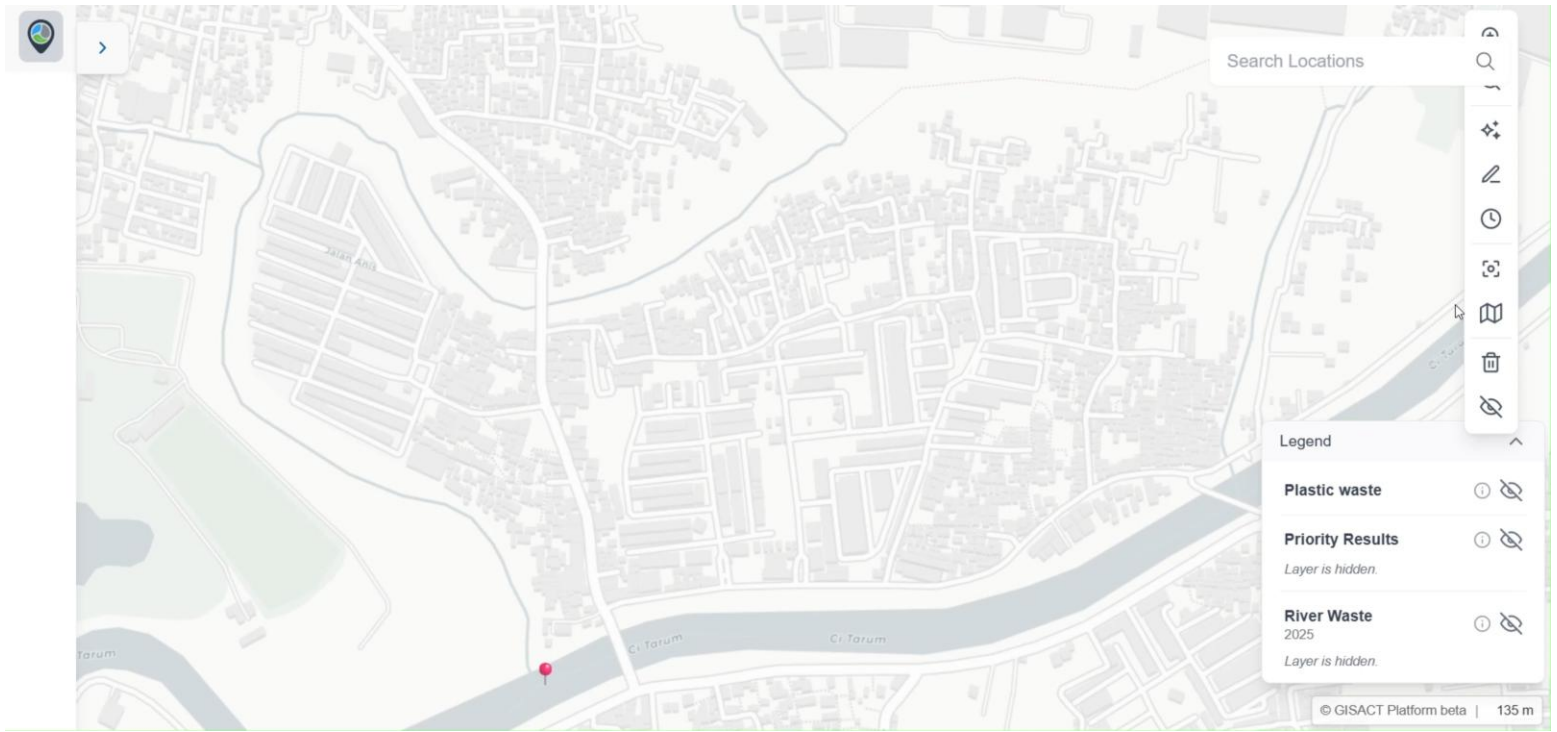


TKN PSL
TIM KOORDINASI NASIONAL
PENANGANAN SAMPAH LAUT

Platform Monitoring Sampah Near Real time dan Pengelolaan Sampah Partisipatif







GISACT-ITB-Satgas Citarum Harum- DPMD –DLH Jabar







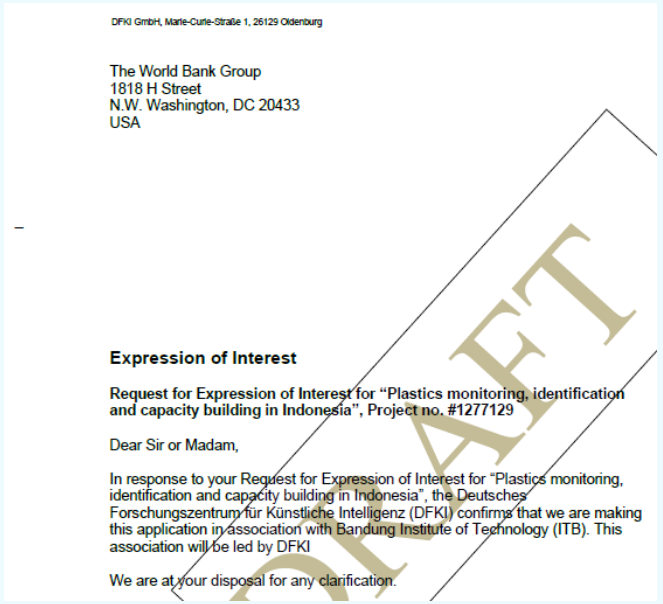




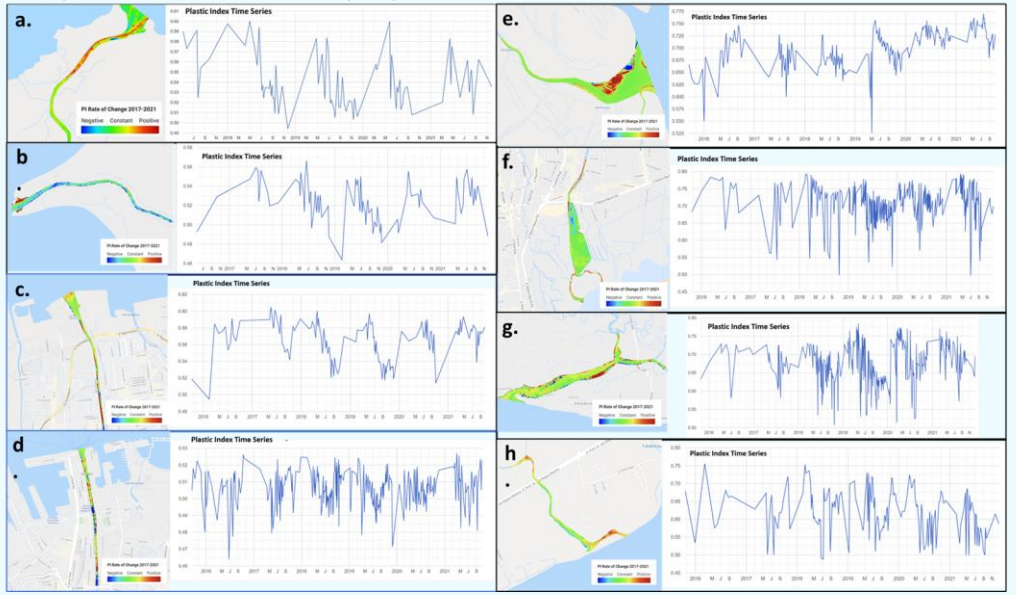


DFKI-ITB-World Bank- Kemenko Marivest (2021)



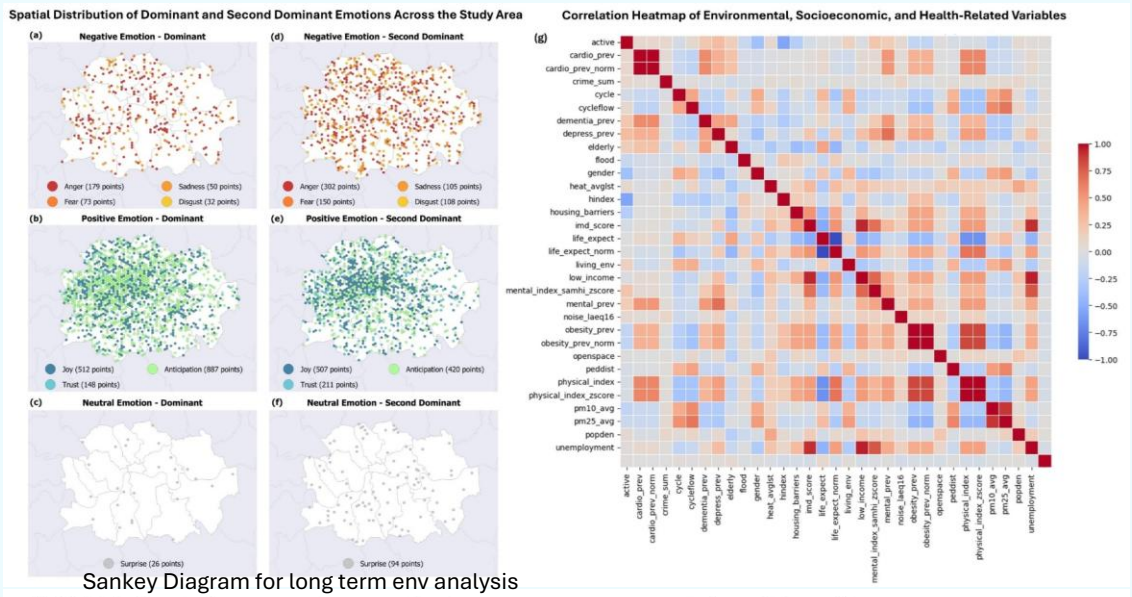


Tren perubahan nilai indeks sampah plastik 2017-2022

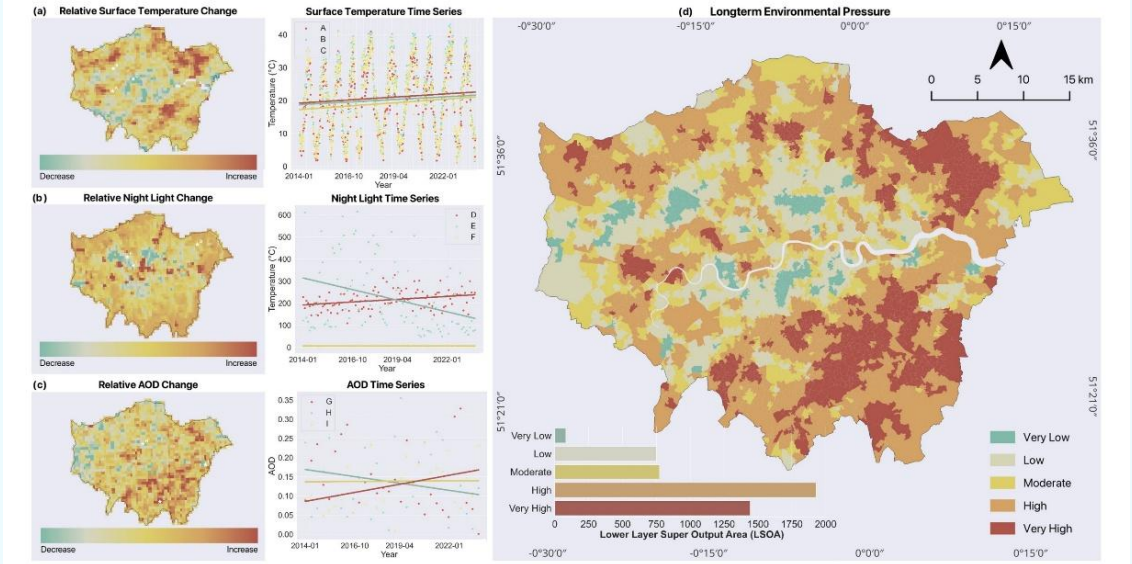


a. Cisadane Tangerang
b. Citarum Bekasi
c. Kaligarang Semarang
d. Kaligamas Surabaya
e. Brantas Pasuruan
f. Badung Bali
g. Prancak Bali
h. Saba Bali

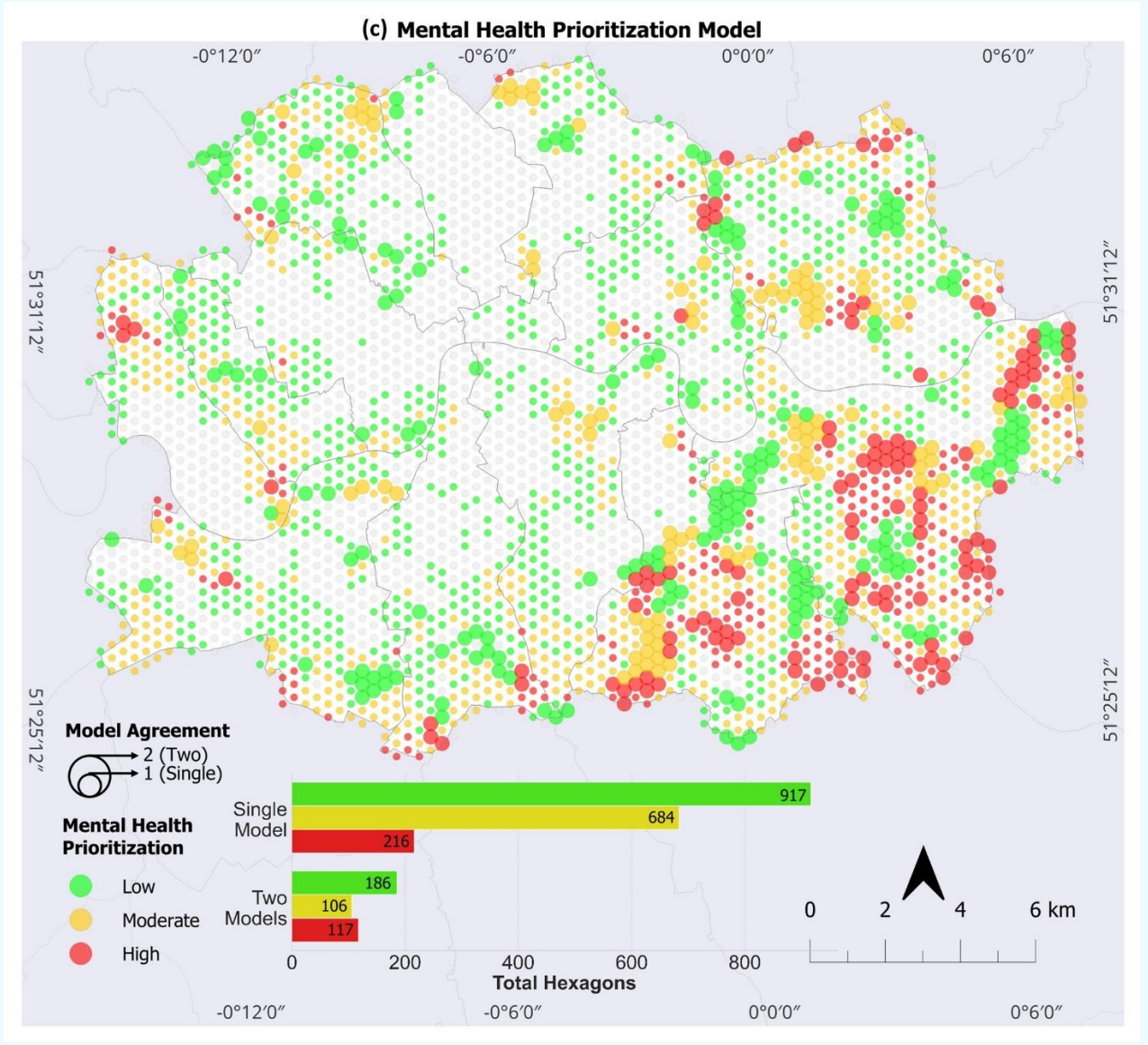
Modeling Urban Emotional Landscapes and Environmental Inequalities with Machine Learning for Mental Health Planning (London City)



Sankey Diagram for long term env analysis



Mental Health Prioritization Model.



Kolaborasi ITB–Cambridge: Analisis Kesehatan Mental Perkotaan Berbasis Geospasial

Environmental determinants of urban mental health in London derived from social media analytics and geospatial machine learning

Cities 174 (2026) 107033

Contents lists available at ScienceDirect

Cities

journal homepage: www.elsevier.com/locate/cities

Environmental determinants of urban mental health in London derived from social media analytics and geospatial machine learning

Anjar Dimara Sakti [a,b], Haifeng Niu [c,*], Elisabete A. Silva [a]

[a] Laboratory of Interdisciplinary Spatial Analysis, Department of Land Economy, University of Cambridge, Cambridge, United Kingdom
[b] Geographic Information Sciences and Technology Research Group, Faculty of Earth Sciences and Technology, Institut Teknologi Bandung, Indonesia
[c] School of Public Administration and Policy, Renmin University of China, Beijing, China

ARTICLE INFO

Keywords:
Urban emotions
Environmental inequalities
Mental health
Machine learning

ABSTRACT

Rapid urbanization poses critical challenges to environmental quality, public health, and emotional well-being. This study presents a machine learning framework integrating longterm environmental pressure, socioeconomic, and health predictors with spatial analysis to model urban emotions and prioritize mental health interventions across Inner London. PM10 concentrations (8.8%), noise pollution (7.8%), and PM2.5 levels (5.3%) were identified as dominant drivers of negative emotions, particularly in eastern boroughs with socioeconomic disparities. Positive emotions, such as joy and trust, were associated with open space accessibility (8.2%) and normalised difference vegetation index (7.2%), indicating that green infrastructure corresponds to areas where more positive emotional expressions are observed. The Mental Health Prioritization Model identified 117 high-priority hexagons in environmentally stressed areas, offering actionable insights for targeted interventions. These findings offer a framework for examining spatial patterns of environmental inequality and emotional expressions, which may support broader discussions on urban sustainability.

1. Introduction

Rapid urbanisation has significantly transformed global population distribution, with urban regions experiencing immense emotional well-being challenges, with economic opportunities, modern infrastructures, and health predictors, PM10 concentrations (8.8%), noise pollution (7.8%), and PM2.5 levels (5.3%) were identified as dominant drivers of negative emotions, particularly in eastern boroughs with socioeconomic disparities. Positive emotions, such as joy and trust (Bettencourt et al., 2007; Rapid urbanisation has significantly transformed global population distribution, with urban regions experiencing immense emotional well-being challenges, with economic opportunities, modern infrastructures, and health predictors with spatial analysis to model urban emotions and prioritize mental health interventions across Inner London. PM10 concentrations (8.8%), noise pollution (7.8%), and PM2.5 levels (5.3%) were identified as dominant drivers of negative emotions, particularly in eastern boroughs with socioeconomic disparities. Positive emotions, such as joy and trust, Bokeoda et al., 2002, & Chirioodoulou, 2012; Shen et al., 2011). A comprehensive understanding of urban transformations and residents' emotional response is essential for designing policies that ensure well-being and resilience.

* Corresponding author.
E-mail address: haifeng.niu@ruc.edu.cn (H. Niu).

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Available online 21 April 2026
0264-2751/© 2026 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1 **Kombinasi data media sosial dan data satelit**

Menggabungkan ekspresi/emosi dari media sosial (misalnya Twitter) dengan variabel lingkungan hasil penginderaan jauh untuk menganalisis kesehatan mental perkotaan.

2 **Analisis kesehatan mental dan kerentanan sosial perkotaan**

Memetakan pola spasial emosi, tekanan lingkungan (seperti kualitas udara, kebisingan, dan ruang hijau), serta area yang berpotensi mengalami kerentanan sosial di Kota London.

3 **Kolaborasi ITB memimpin bersama Cambridge**

Penulis dari ITB berperan penting dalam kolaborasi internasional dengan University of Cambridge untuk menerapkan pendekatan *geospatial machine learning* pada konteks Kota London.

4 **Kontribusi teknologi**

Mengintegrasikan data PM10, PM2.5, kebisingan, NDVI/lingkungan hijau, data media sosial, dan machine learning untuk menghasilkan wawasan yang dapat mendukung kebijakan kota yang lebih sehat dan inklusif.

Poin Utama

1. Menghubungkan data sosial dan lingkungan dalam satu kerangka analisis.
2. Membantu identifikasi area prioritas intervensi kesehatan mental perkotaan.
3. Menunjukkan kapasitas ITB dalam kolaborasi riset global berbasis geospasial.

Sumber: Cities (2026), Elsevier | Kolaborasi ITB – University of Cambridge

Dinamika Kerawanan Kejahatan Jalanan di Kota Bandung

Sejak Agustus 2015 hingga Juli 2026, pemberitaan daring menunjukkan bahwa lokasi kejahatan jalanan tidak terkonsentrasi pada satu ruas. Polanya muncul dan bergeser di berbagai koridor jalan Kota Bandung dari waktu ke waktu.

1



Bagaimana Pola Risiko Berubah dari Waktu ke Waktu?

Melalui pendekatan *machine learning*, karakter visual jalan dari berbagai sumber foto ruas jalan dianalisis bersama titik kejadian pencurian kendaraan bermotor. Pembaruan data dari Oktober 2023 hingga Juli 2026 kemudian menunjukkan koridor yang semakin berisiko dari waktu ke waktu.



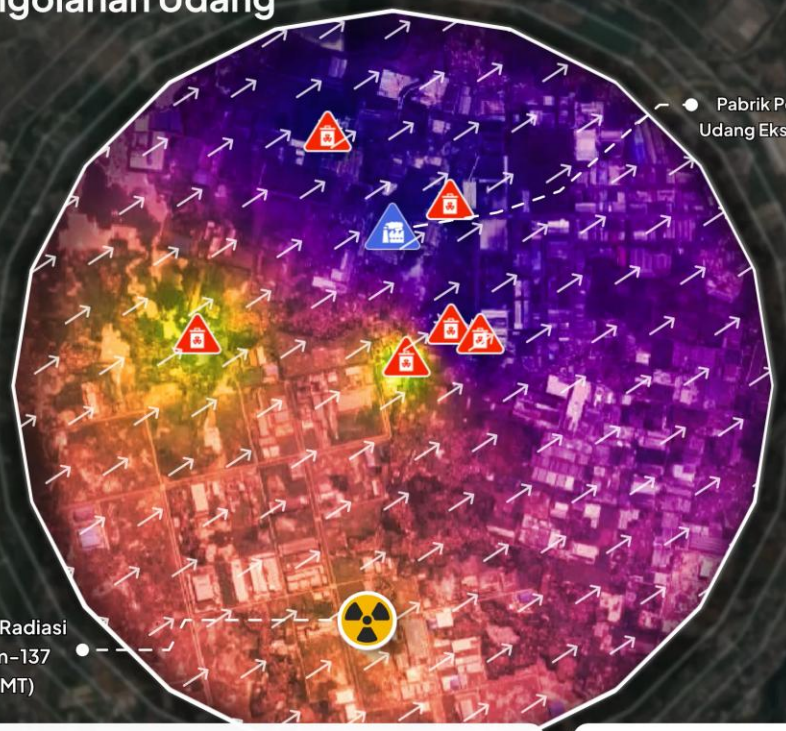


Pola risiko tidak menyebar merata, tetapi semakin terkonsentrasi pada koridor tertentu. Sejumlah ruas tetap menonjol, sementara lainnya berubah mengikuti pembaruan data. Pergeseran paling kuat terlihat pada lima koridor, yang menunjukkan kenaikan skor risiko relatif terbesar sejak Oktober 2023.

GISACT
Geo-Intelligence Solution

#GeospatialQuickResponse

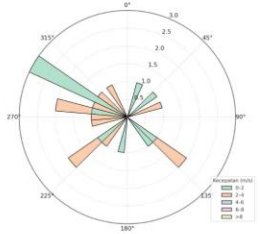
Arah Angin Permukaan Mengarah ke Pabrik Pengolahan Udang



Jejak Radiasi dalam Pola Data Arah Angin

- Data ERA5 menunjukkan **angin dominan berasal dari barat daya** (230°) dan bergerak ke timur laut, cukup searah pabrik pengolahan udang.
- Sementara itu, data BMKG menampilkan pola yang lebih bervariasi, namun tetap didominasi hembusan dari selatan hingga barat daya (135°–230°) dengan kecepatan 2–4 m/s.
- Pola ini memperkuat dugaan bahwa partikel radiasi Cs-137 dapat terbawa angin, bergerak dari kawasan industri menuju pabrik pengolahan udang.

Chart Wind Rose Data BMKG Bulan Mei Tahun 2025

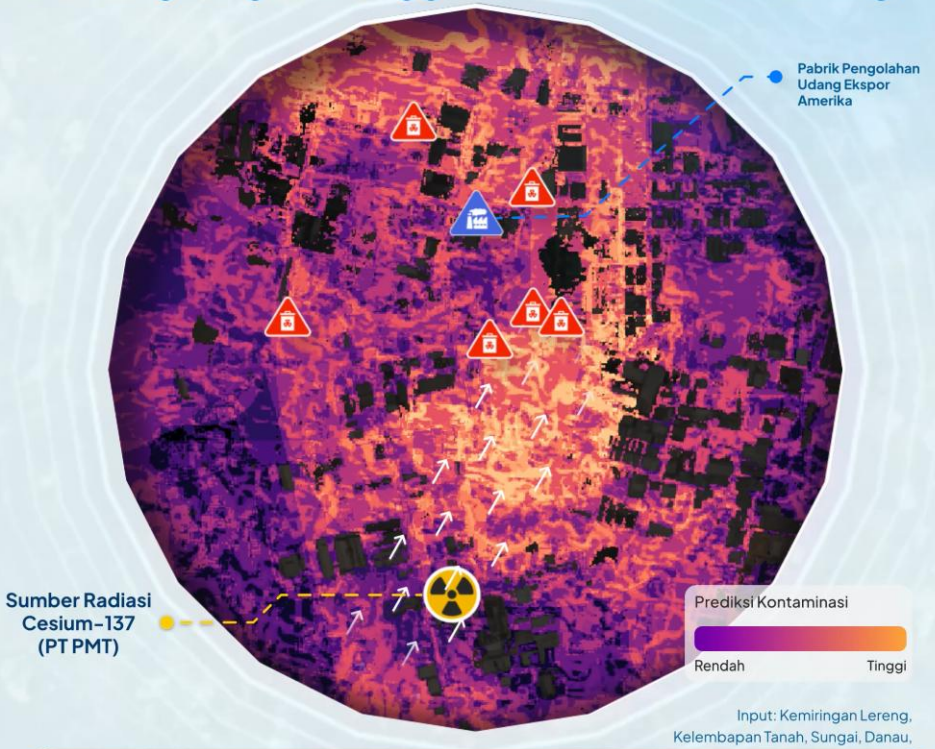


Stasiun Meteorologi Budiarto, Tangerang

GISACT
Geo-Intelligence Solution

#GeospatialQuickResponse

Prediksi Potensi Kontaminasi Berbasis Faktor Fisik dan Lingkungan Menggunakan *Machine Learning*



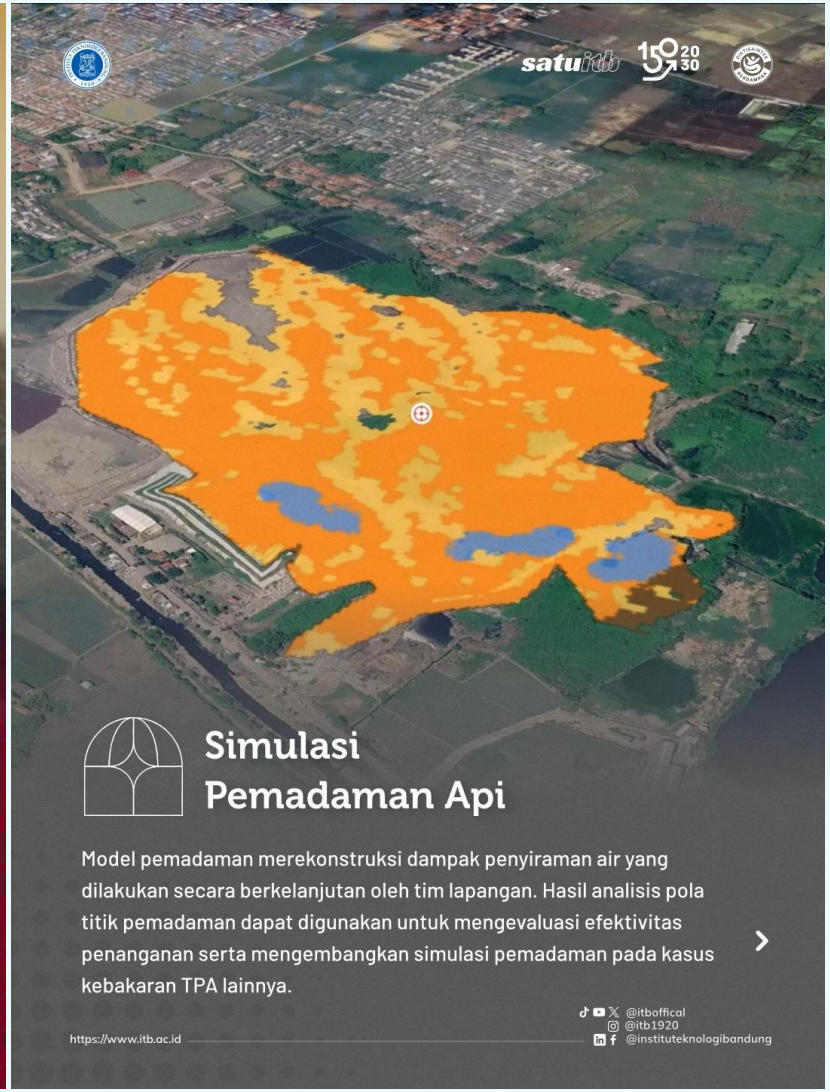
Input: Kemiringan Lereng, Kelembapan Tanah, Sungai, Danau,

Hasil *machine learning* berbasis faktor fisik dan lingkungan menunjukkan potensi akumulasi Cs-137 di **area lembap dan datar** sekitar badan air. Temuan ini melengkapi analisis sebelumnya, di mana tanah kering memicu difusi udara, sedangkan **tanah lembap meningkatkan akumulasi radionuklida** dan sejalan dengan studi pasca-Fukushima yang membuktikan mobilitas Cs-137 melalui air tanah dan sungai [14, 15].



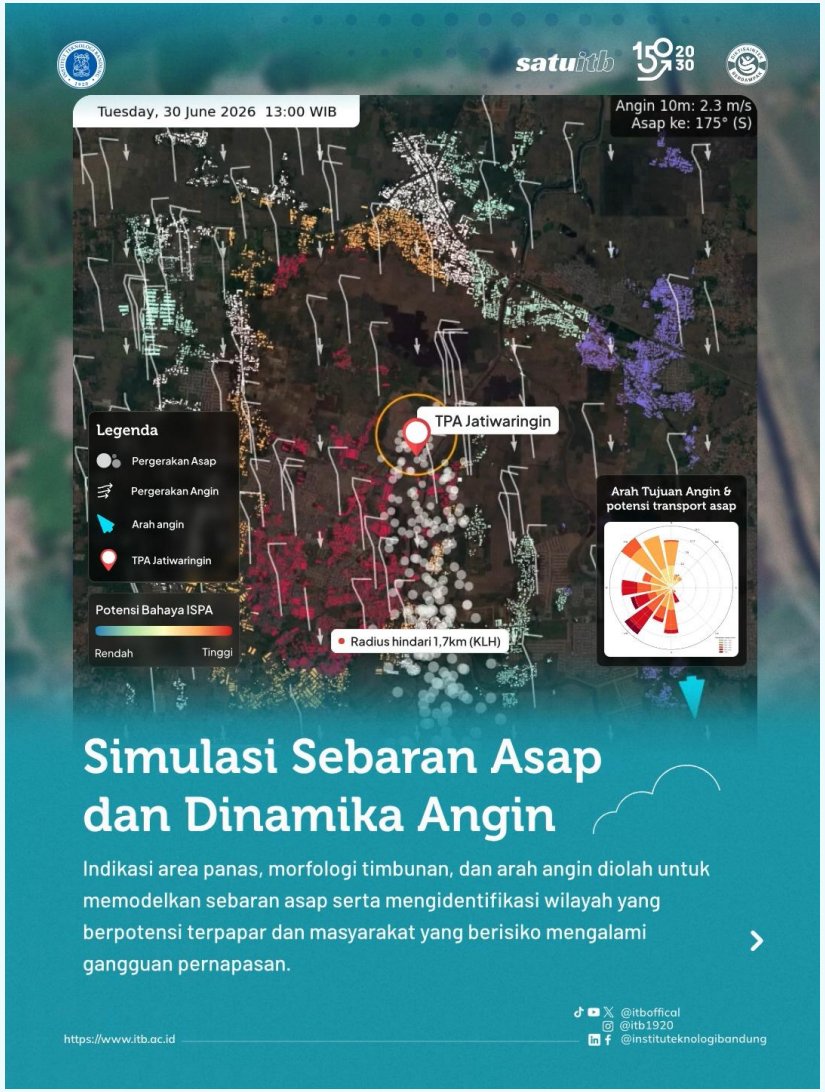
Dari Drone hingga Satelit: Analisis Kebakaran TPA Jatiwaringin

Kolaborasi tim peneliti ITB, Kementerian Lingkungan Hidup, dan BNPB dalam melakukan pemodelan spasial dalam merekonstruksi perambatan api serta proses pemadaman kebakaran di TPA.



Simulasi Pemadaman Api

Model pemadaman merekonstruksi dampak penyiraman air yang dilakukan secara berkelanjutan oleh tim lapangan. Hasil analisis pola titik pemadaman dapat digunakan untuk mengevaluasi efektivitas penanganan serta mengembangkan simulasi pemadaman pada kasus kebakaran TPA lainnya.



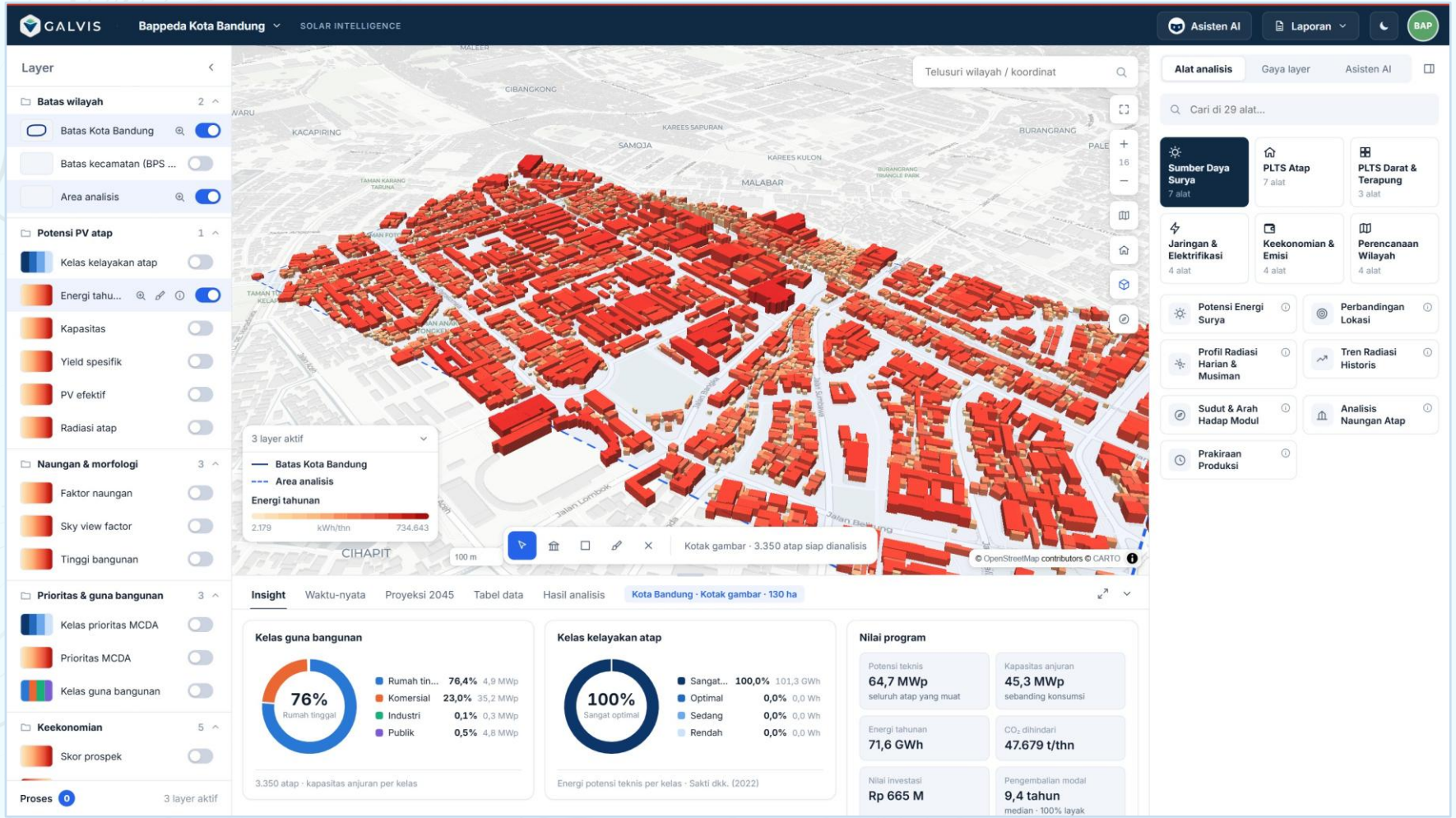
Simulasi Sebaran Asap dan Dinamika Angin

Indikasi area panas, morfologi timbunan, dan arah angin diolah untuk memodelkan sebaran asap serta mengidentifikasi wilayah yang berpotensi terpapar dan masyarakat yang berisiko mengalami gangguan pernapasan.

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GALVIS Solar Intelligence

ViriyaENB · KEMENTERIAN ESDM · Institut Teknologi Bandung 1920



Potensi PV atap, keekonomian, dan daya waktu-nyata untuk setiap bangunan di Kota Bandung.

Himawari-9 tiap 10 menit
Irradiance satelit, observasi dan prakiraan

Naungan pada kisi 5 m
Profil horizon dari bangunan 3D sekitar

Keekonomian per atap
Investasi, penghematan, masa balik modal

Asisten AI
Tanya-jawab analisis dalam bahasa sehari-hari

3.350
atap dianalisis (130 ha)

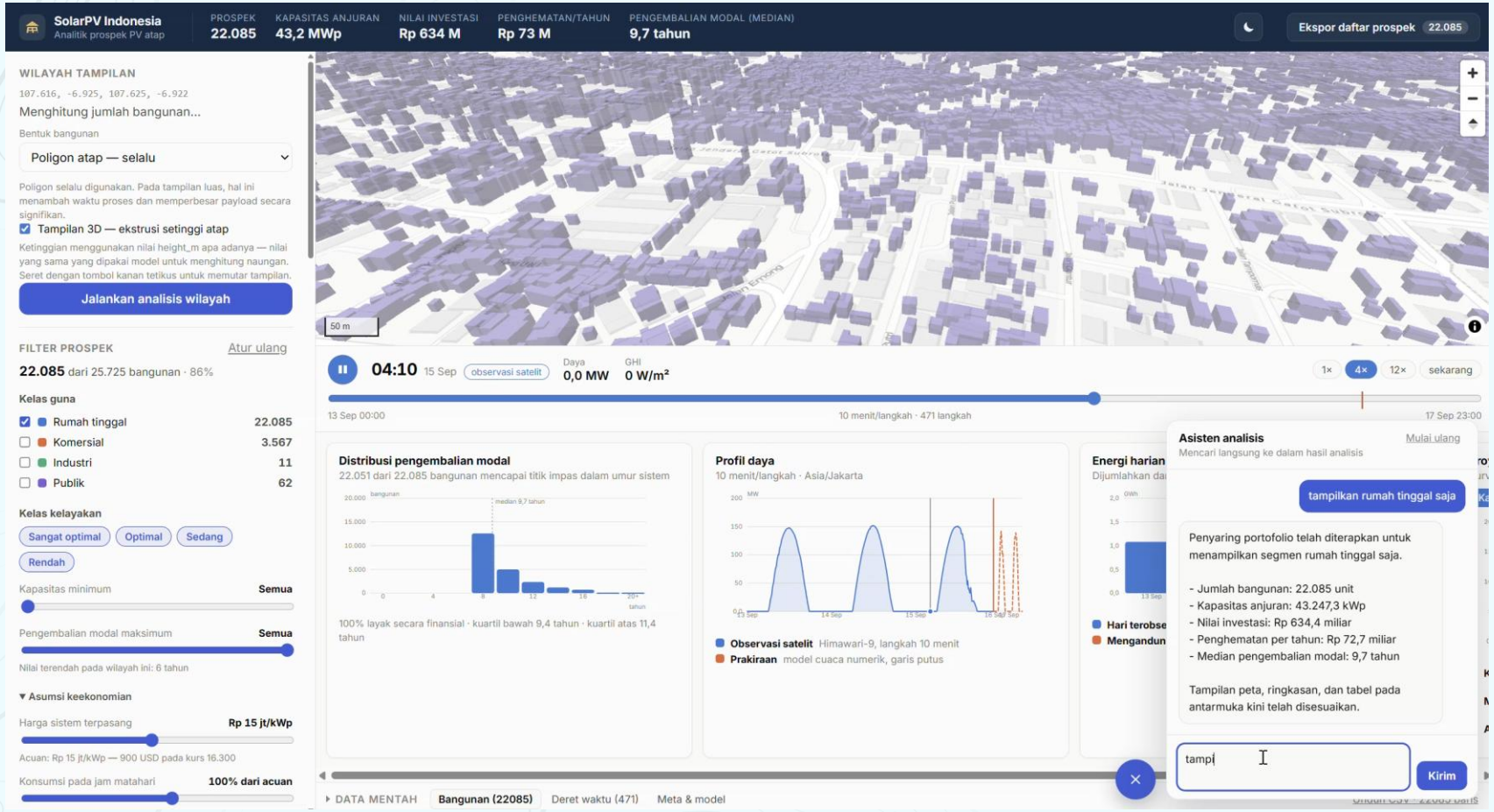
64,7 MWp
potensi teknis PV atap

71,6 GWh
energi per tahun

47.679 t
CO_2 dihindari per tahun

GISACT

GALVIS Solar Intelligence



3.350
atap dianalisis (130 ha)

64,7 MWp
potensi teknis PV atap

71,6 GWh
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Potensi PV atap, keekonomian, dan daya waktu-nyata untuk setiap bangunan di Kota Bandung.

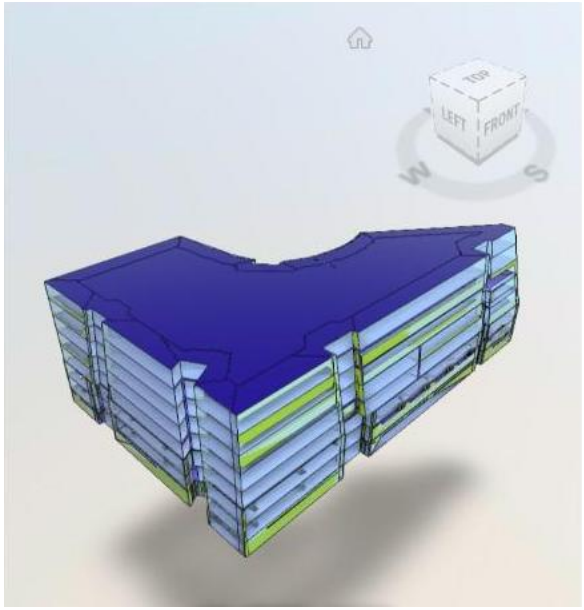
Himawari-9 tiap 10 menit
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Naungan pada kisi 5 m
Profil horizon dari bangunan 3D sekitar

Keekonomian per atap
Investasi, penghematan, masa balik modal

Asisten AI
Tanya-jawab analisis dalam bahasa sehari-hari

Energy model: content, navigation, LOIN



29,164 m² Building area

5 Thermal zones

Office Building type

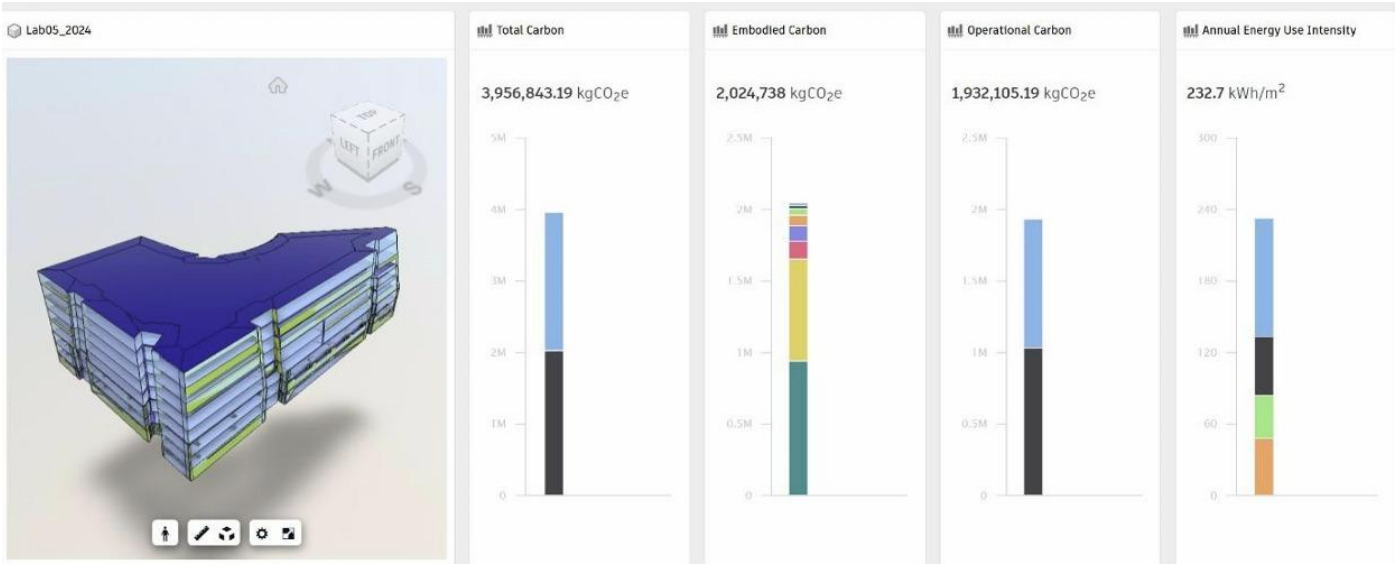
Melbourne Location (temperate)

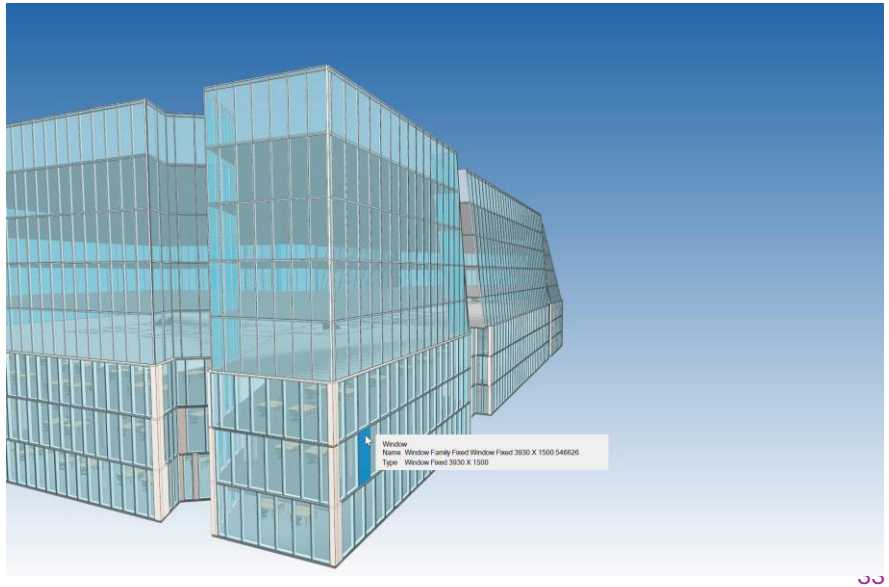
NAVIGATE

- Analyze tab: Energy Settings (location, building type, mode)
- Spaces and zones: type, occupancy
- Energy analytical model view: surfaces and spaces
- Systems Analysis report and Insight dashboard

LOIN: ZONES G2 / I2

Zone boundaries and volumes only need to represent the occupied spaces for simulation (G2). Space type, occupancy and energy settings are required (I2). Every assumption is in the inputs log. Trade-off: no fabrication geometry or product data.





Empat Publikasi Rujukan Publikasi ITB di Top Tier Journal Q1 Energi dan Geospasial

Halaman pertama publikasi yang menjadi dasar metode, dari skala kota hingga skala regional.



BASIS 1 · SKALA KOTA

Prioritas PLTS atap tingkat kota

Sakti et al. (2022) · Remote Sensing

doi.org/10.3390/rs14122796



BASIS 2 · SKALA BANGUNAN

Potensi surya per bangunan

Ihsan et al. (2024) · Energy and Buildings

doi.org/10.1016/j.enbuild.2024.114552

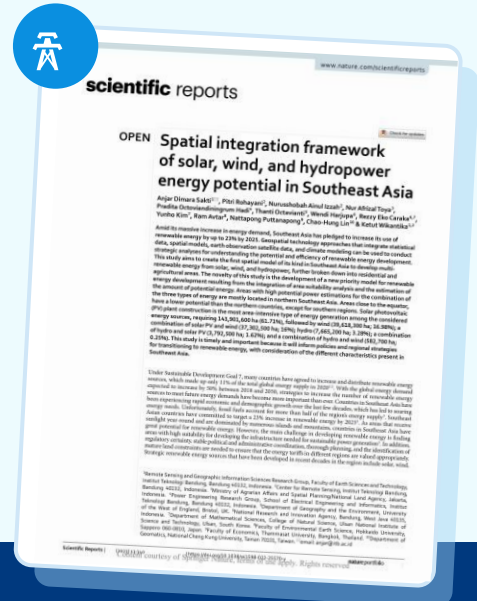


BASIS 3 · SKALA WAKTU

Variasi intensitas sinar matahari

Ihsan et al. (2024) · Solar Energy

doi.org/10.1016/j.solener.2024.112678



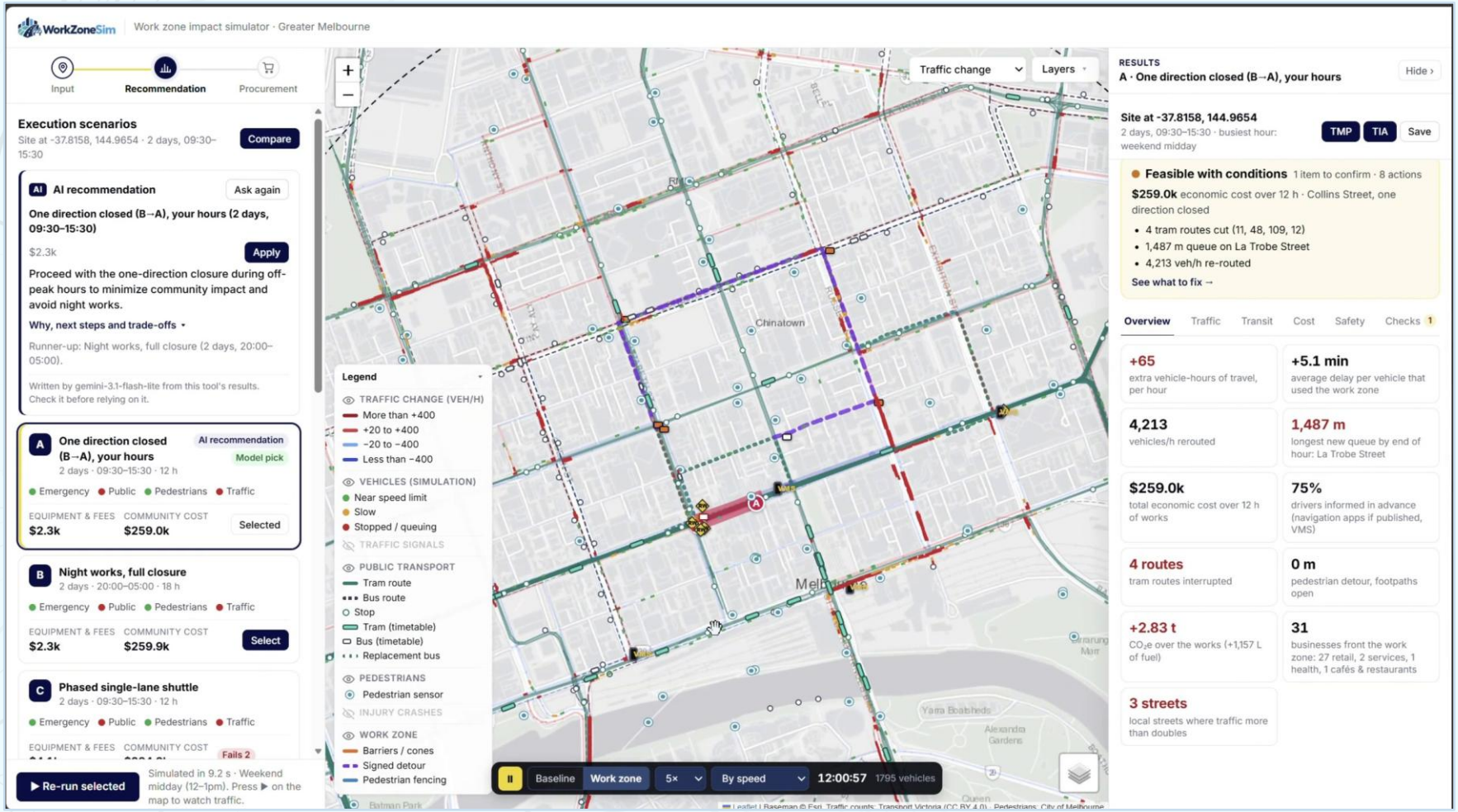
BASIS 4 · SKALA REGIONAL

Energi terbarukan Asia Tenggara

Sakti et al. (2023) · Scientific Reports

doi.org/10.1038/s41598-022-25570-y

WorkZone Sim: Dampak Pekerjaan Jalan



Simulasi skenario penutupan jalan sebelum pekerjaan dimulai, Greater Melbourne, Australia.

Rekomendasi skenario AI
Siang, malam, atau penutupan bertahap

Simulasi lalu lintas
Pengalihan, antrean, dan waktu tempuh

Dampak transportasi umum
Rute trem dan bus yang terputus

Keselamatan dan biaya
Riwayat kecelakaan, rambu, estimasi biaya

4.213
kendaraan/jam dialihkan

1.487 m
antrean baru terpanjang

4 rute
trem terputus

US$259 rb
biaya ekonomi (12 jam)

Digital Twin Ocean

Enam fitur dalam satu antarmuka peta

1. **Peta seluruh KNMP**
2. **Profil kampung**
3. **Status melaut**
4. **Skor prioritas**
5. **Lokasi KNMP baru**
6. **Risiko lingkungan**



1 | 2 | 3 | 4 | 5 | 6

Global Forum Group on Earth Observations

Remote Sensing-Focused Global Consortium of 114 Countries



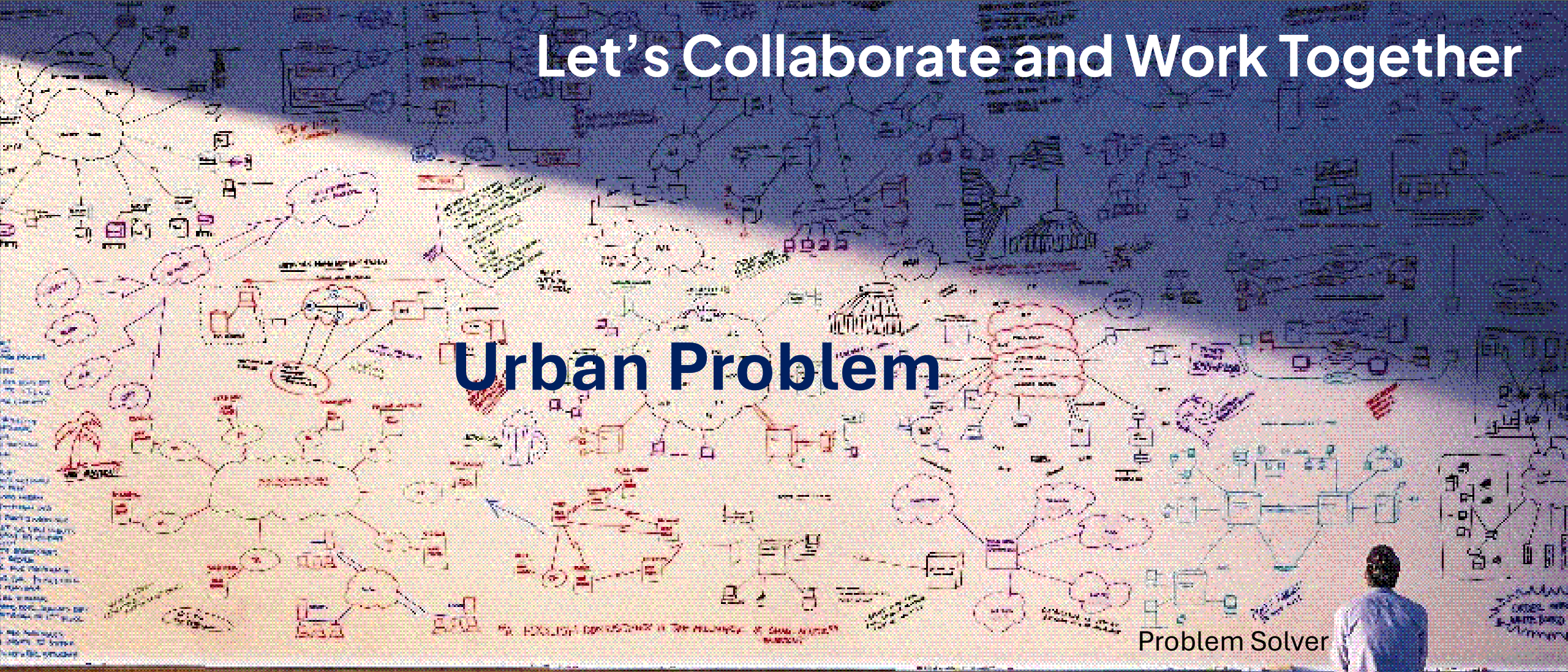


GEO SDG Award 2025, Roma Italy





Let’s Collaborate and Work Together

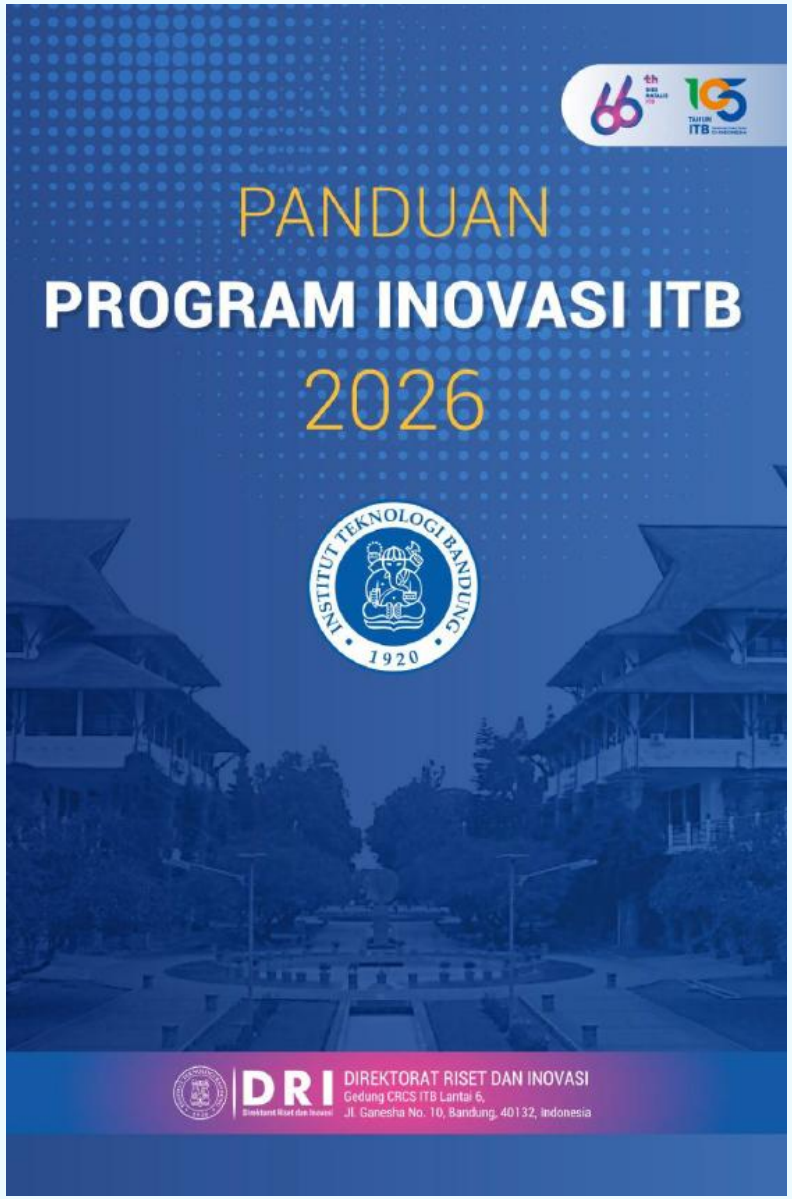


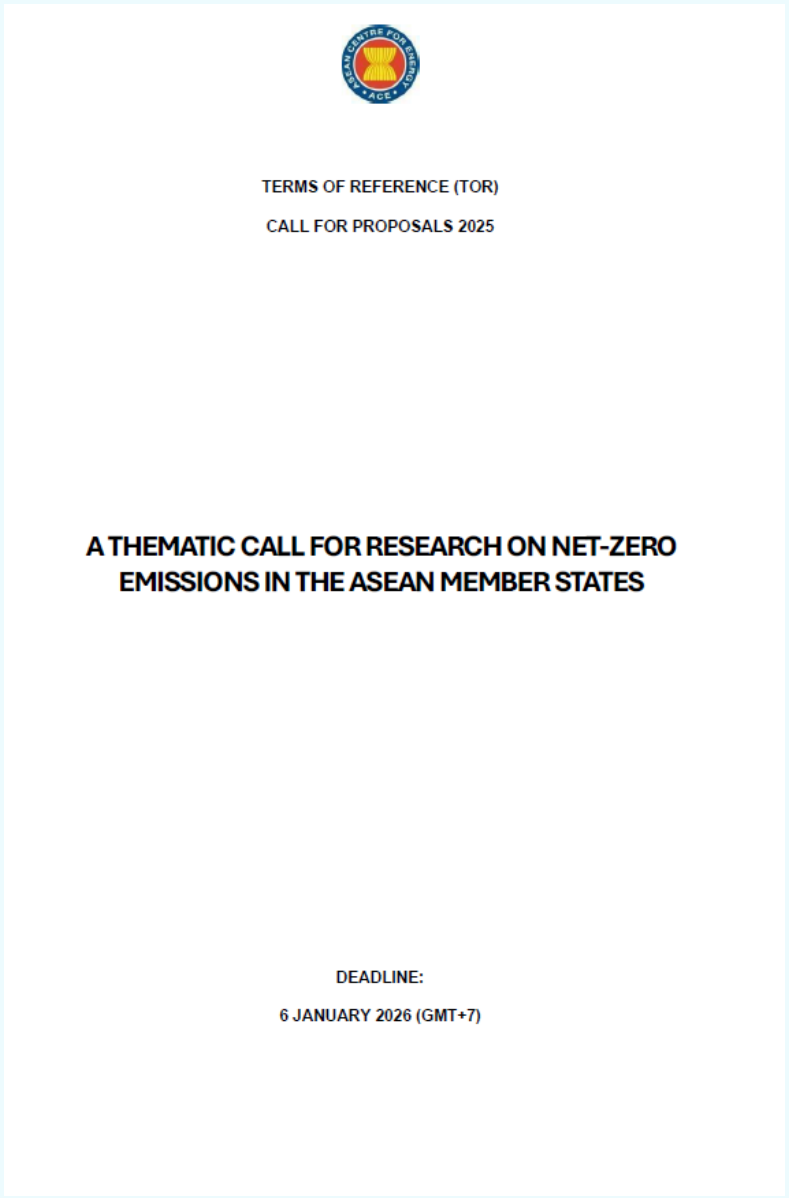
Geospatial Data Saintis Laboratories as Innovation Hub

Saintis Data

Thank you

Alternatif Pendanaan





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6 JANUARY 2026 (GMT+7)

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The Alan Turing Institute

European Commission

Horizon Europe 2021-2027

CRS ITB- GISACT

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Gisact as Innovation Hub of CRS ITB

We are an innovation hub established by the Center for Remote Sensing - Institut Teknologi Bandung (CRS-ITB), dedicated to creating impactful geospatial solutions through collaborative research and development.



Contact Us

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082319004296 | contact@gisact.io

Digital Twin Cities: Dari Kota Ke Solusi Permasalahan Perkotaan

Pengembangan Teknologi Geo-Intelligence dalam Pengembangan Smart City

Anjar Dimara Sakti

Director of GISACT Geo Intelligence
Center for Remote Sensing
Institut Teknologi Bandung