



PREDICTION AND CLASSIFICATION OF FLOOD AREAS IN BANDUNG DISTRICT

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BACKGROUND

Bandung Regency is frequently hit by floods due to high rainfall, overflow of the Citarum River, land use change, and poor drainage. These disasters cause material losses, activity disruption, and environmental impacts. Technological approaches such as machine learning are needed to predict and classify floods, to support mitigation efforts and reduce their impact.



PROBLEM STATEMENT

BENEFITS

RESEARCH QUESTIONS

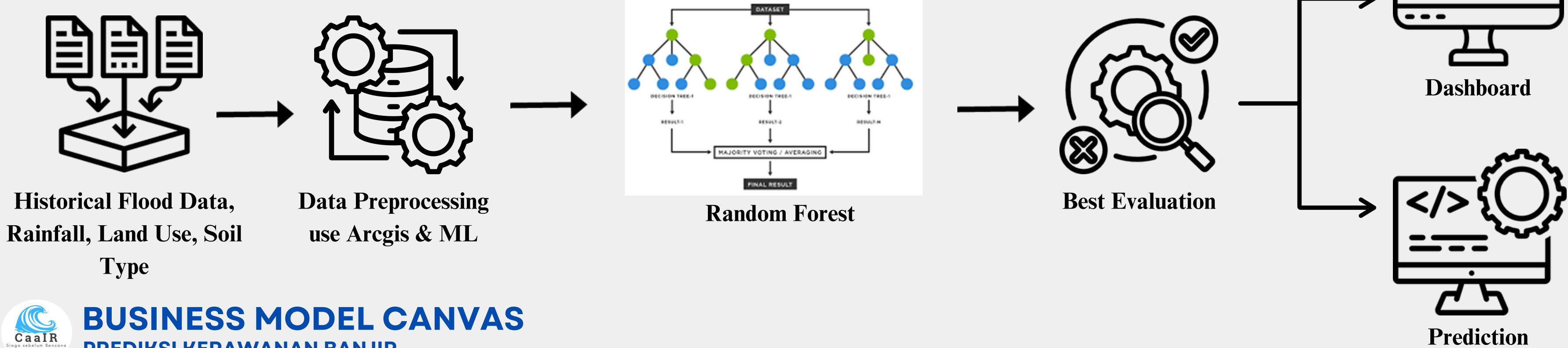
1. How can areas in Bandung Regency be classified based on flood risk levels using the Random Forest algorithm?
2. How can the results of flood risk analysis and prediction be utilized to support mitigation efforts and determine safe locations for development?

OBJECTIVES

1. To classify areas in Bandung Regency based on flood risk levels using the Random Forest algorithm.
2. To analyze and predict flood vulnerability as a basis for making decisions on mitigation measures and selecting safer development locations.

- Provide accurate information on flood risk levels in various areas of Bandung Regency.
- Support the government and community in planning more effective disaster mitigation strategies.
- Assist in development planning to avoid high-risk flood-prone areas.
- Optimize the use of technology in disaster management to enhance preparedness and reduce flood impacts.

GRAPHICAL ABSTRACT



BUSINESS MODEL CANVAS

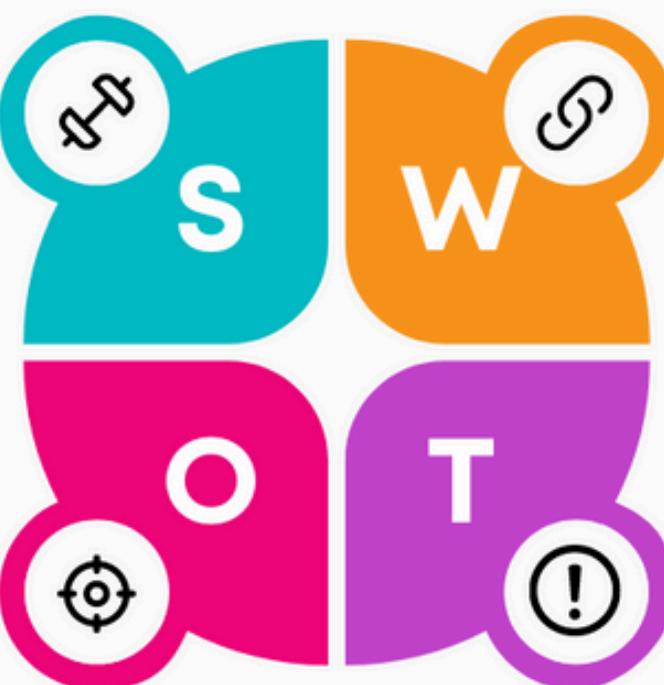
PREDIKSI KERAWANAN BANJIR

Designed For: Project Capstone Designed By: Kelompok 6

ate: Version:



SWOT Analysis



strengths

- # Kolaborasi dengan Lembaga Pemerintah Aplikasi Berbasis Machine Learning Fokus Data dan Teknologi

Opportunities

- Kerjasama dengan Pemerintah Daerah
 - Eksplorasi Fitur Pertumbuhan Teknologi IoT dan Big Data
 - Tingkat Kepedulian Publik yang Meningkat terhadap Bencana

Weaknesses

- Ketergantungan pada Infrastruktur Cloud
 - Ketergantungan pada Data Eksternal
 - Keterbatasan Tim

Threats

- Perubahan Kebijakan Pemerintah
 - Persaingan dengan Platform Lain
 - Keandalan Infrastruktur Cloud
 - Ketidakpastian Cuaca Ekstrem

CREATION OF DATA SETS USING ARCGIS SOFTWARE

rainfall data Source: BMKG

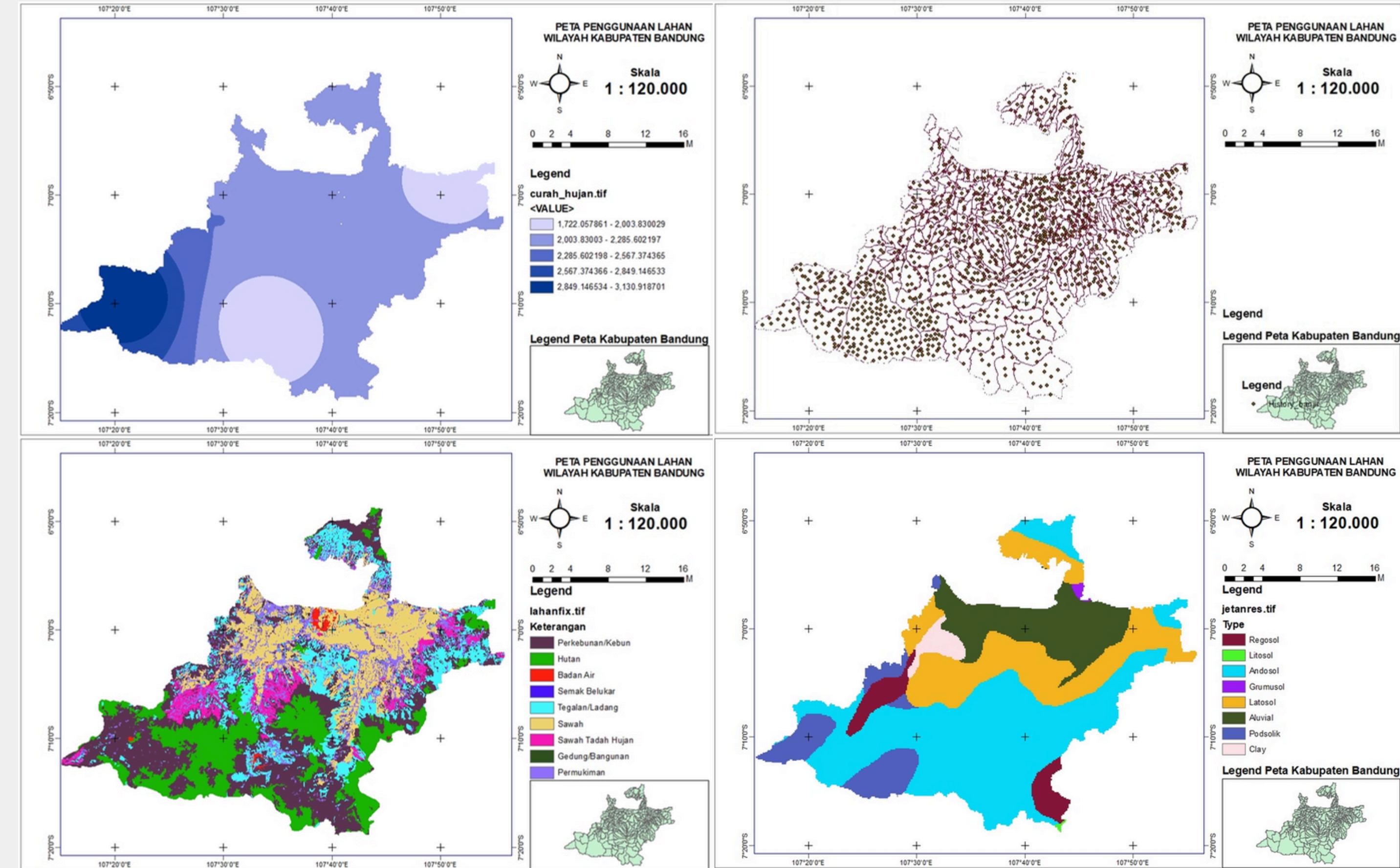
Historical Flood Data : BNPB

Land Use Data Source : Bappeda

Soil Type Data Source : Bappeda

ANALYZE DATA WITH MACHINE LEARNING

Link Code :



SOLUTION WEBSITE CAIR

Prediction and Classification



CaaIR (Check Flood Areas and Risk Information) is a web-based dashboard solution that provides flood risk predictions for Bandung Regency. This solution utilizes the Random Forest algorithm to classify flood risk levels based on various factors such as rainfall intensity, geographical conditions, land use, and drainage systems.

Key features of CaaIR:

1. Interactive Dashboard: Displays flood risk data visually, including risk maps and analytical charts.
2. Risk Prediction: Provides predictions for flood-prone areas to help governments and communities plan mitigation efforts.
3. Risk Factor Information: Offers data on flood-causing factors to support data-driven decision-making.

With CaaIR, communities and governments can better prepare for potential flooding and determine safe and strategic development locations.

The screenshot displays four dark mode dashboard pages from the CaaIR website:

- Home:** Shows a navigation menu with Home, Informasi, Prediksi, Peta Wilayah, and About Us. It includes a "Mode Terang" button and a timestamp of Waktu: 21.37.54.
- Predictions:** Features three cards: "Accurate Predictions" (Utilizing the latest AI technology to predict flood risks), "Comprehensive Analysis" (Analyze rainfall, land usage, and soil type effectively), and "User-Friendly" (Simple interface for all users). It also includes an "AI-Driven Insights" card with the text "Leverage AI to gain deeper insights for better decision making".
- Analysis:** Contains a section titled "Informasi Bandung" with the text "Bandung sering dilanda banjir akibat berbagai faktor, seperti curah hujan tinggi, penggunaan lahan yang tidak terencana, dan jenis tanah yang kurang menyerap air. Berita terbaru menyebutkan beberapa daerah di Bandung yang paling terdampak, seperti kawasan Cileunyi, Cibiru Wetan dan lain-lain, sering menghadapi banjir parah setelah hujan deras. Penyebaran utama meliputi saluran drainase yang tersumbat, urbanisasi yang cepat, dan kurangnya ruang terbuka hijau." Below this is a bar chart titled "Top 10 Lokasi dengan Risiko Banjir" (Top 10 Locations with the Highest Flood Occurrences) showing the number of flood occurrences for various locations.
- Classification:** Contains a "Prediksi Banjir" section with a form for entering data: "Masukkan data berikut untuk mengetahui prediksi risiko banjir di lokasi Anda." It includes fields for "Data Prediksi" (Curah Hujan, Jenis Tanah, Penggunaan Lahan), a "Predict" button, and a "Toggle to Dark Mode" button.

THANK YOU

Thank you for explore



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