



# 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

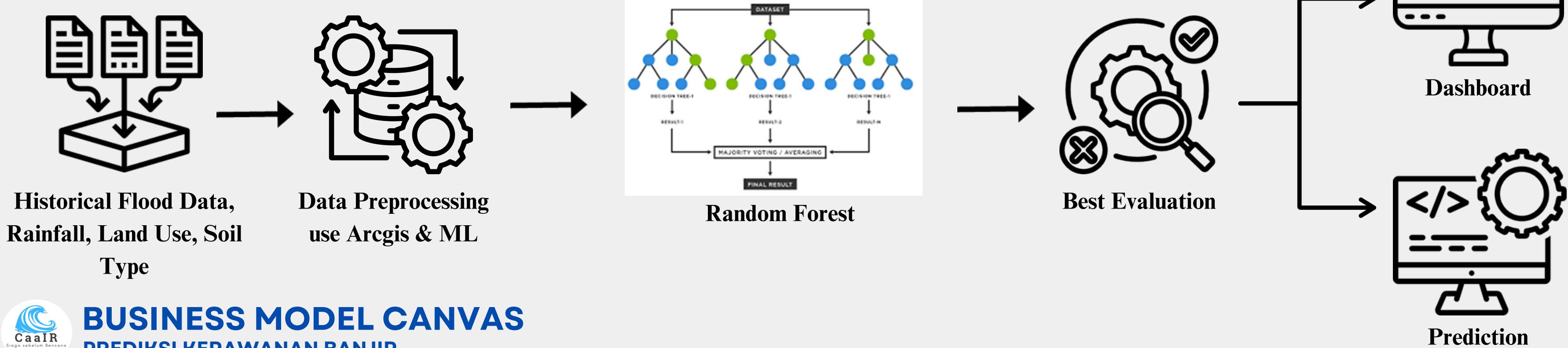
1. How can areas in Bandung Regency be classified based on flood risk levels using the Random Forest algorithm?
2. How can the results of flood risk analysis and prediction be utilized to support mitigation efforts and determine safe locations for development?

## 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

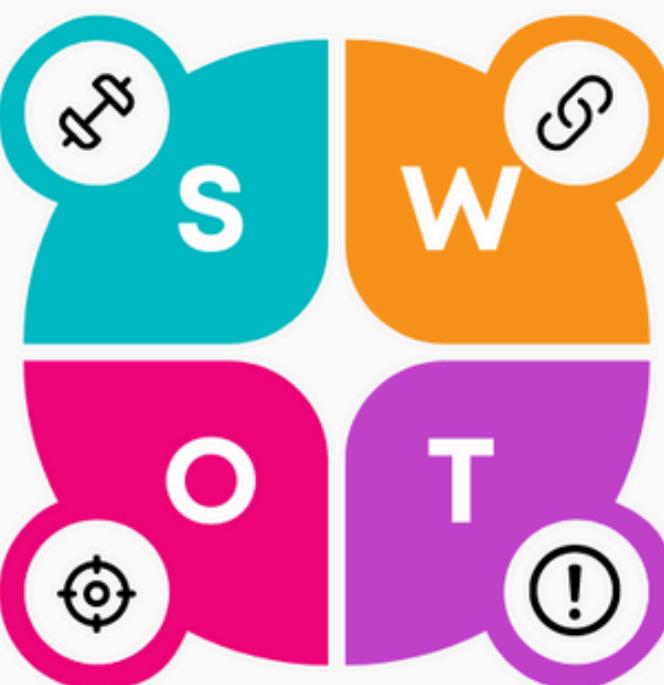
## PREDIKSI KERAWANAN BANJIR

Designed For: Project Capstone      Designed By: Kelompok 6

Date: 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

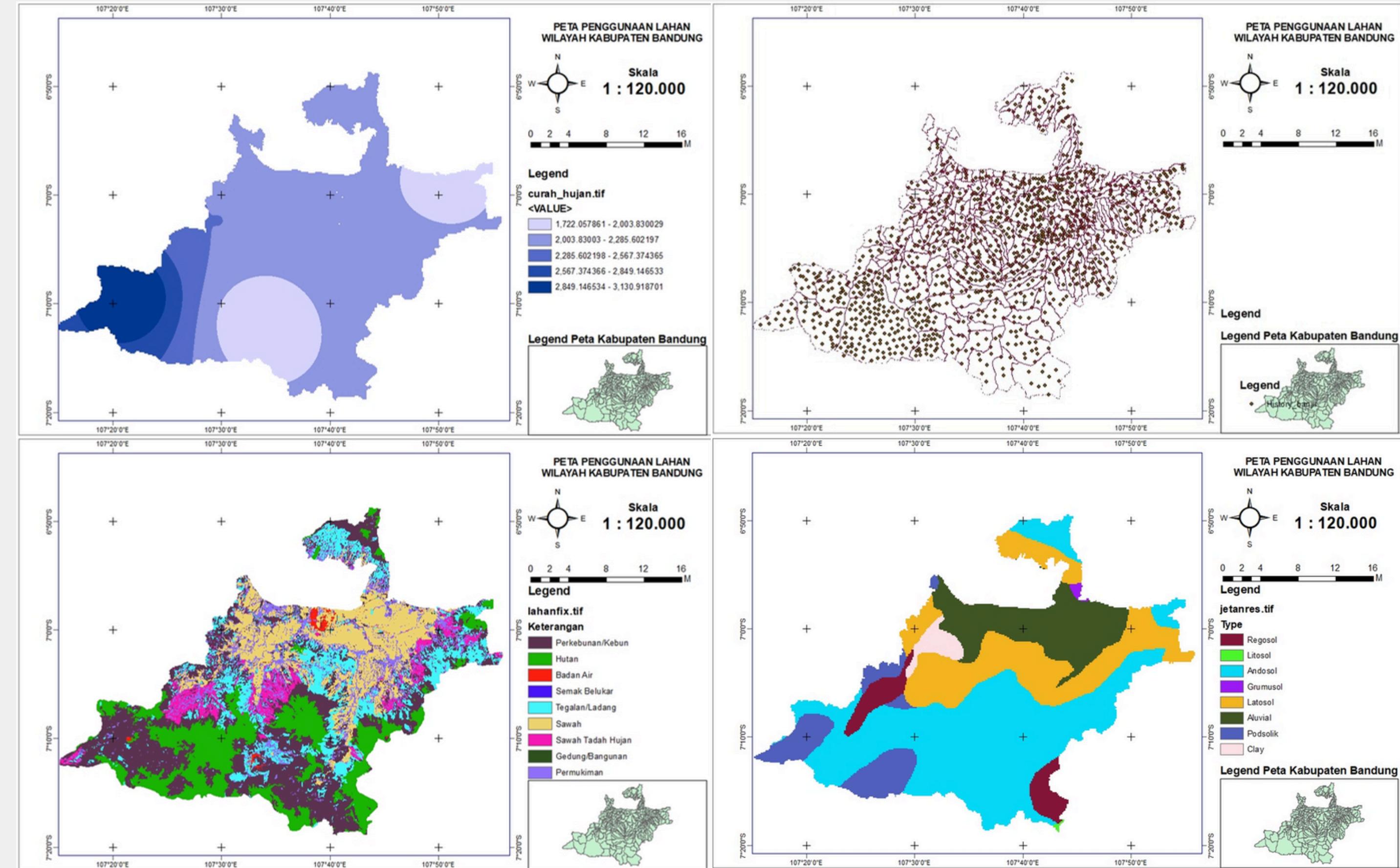
Historical Flood Data : BNPB

Land Use Data Source : Bappeda

Soil Type Data Source : Bappeda

## ANALYZE DATA WITH MACHINE LEARNING

Link Code :



# SOLUTION



*Prediction and Classification*

# WEBSITE

# CAAIR

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.

Waktu: 08.12.00

Vaktu: 08.12.00

# CaalR - Prediksi Banjir Kabupaten Bandung

Sistem prediksi banjir berbasis data yang bertujuan untuk membantu masyarakat Kabupaten Bandung dalam mengantisipasi dan mengelola risiko bencana banjir.

**CaalR**



**Navigasi**

- Home
- Informasi
- Prediksi
- Peta Wilayah

Mode Gelap



### Klasifikasi Risiko Banjir

Kami mengidentifikasi dan mengklasifikasikan daerah berisiko tinggi terhadap banjir di Kabupaten Bandung.

### Prediksi Kejadian Banjir

Dengan memanfaatkan algoritma canggih, kami dapat memprediksi kemungkinan kejadian banjir di masa depan berdasarkan data historis.

### Perencanaan Kebijakan

Informasi yang dihasilkan akan mendukung penyusunan kebijakan mitigasi bencana yang efektif untuk masyarakat Kabupaten Bandung.

Waktu: 08.13.51

# Prediksi Banjir

Masukkan data berikut untuk mengetahui prediksi risiko banjir di lokasi Anda.

Waktu: 08.13.51

**CaaIR**



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**Data Prediksi**

Curah Hujan:

Jenis Tanah:

Penggunaan Lahan:

**Predict**

**Hasil Prediksi:**

Prediction: Rendah

Probabilities:

- Rendah: 0.57
- Tinggi: 0.43

Waktu: 08.12.36

Vaktu: 08.12.36

# Informasi Bandung

Bandung sering dilanda banjir akibat kombinasi 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. Penyebab utama meliputi saluran drainase yang tersumbat, urbanisasi yang cepat, dan kurangnya ruang terbuka hijau.

## Top 10 Lokasi dengan Risiko Banjir

Top 10 Locations with the Highest Flood Occurrences

Lokasi	Jumlah Kebanjiran
Cileunyi, Cibiru Wetan	3.0
Karangkajen, Karangkajen, Citarer	~2.9
Karangkajen, Karangkajen, Citarer	~2.9
Margamukti, Margamukti	~2.9
Parahyangan, Parahyangan, Ciwidey	~2.9
Pancar, Pancar, Pancar, Kuningan	~2.9
Pancar, Pancar, Pancar, Kuningan	~2.9
Rambutan, Rambutan, Rambutan	~2.9
Sukajadi, Sukajadi, Sukajadi	~2.9
Tegalrejo, Tegalrejo, Tegalrejo	1.0
Tegalrejo, Tegalrejo, Tegalrejo	1.0

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Mode Gelap

Naktu: 08.14.52

# THANK YOU

*Thank you for explore*



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