



International Geography Seminar (IGEOS) 2023

MAPPING THE LEVEL OF PHYSICAL AND ECONOMIC VULNERABILITY OF EARTHQUAKE DISASTERS IN CISARUA DISTRICT, WEST BANDUNG

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INTRODUCTION



Indonesian geological conditions



Eathquake history in Lembang Fault

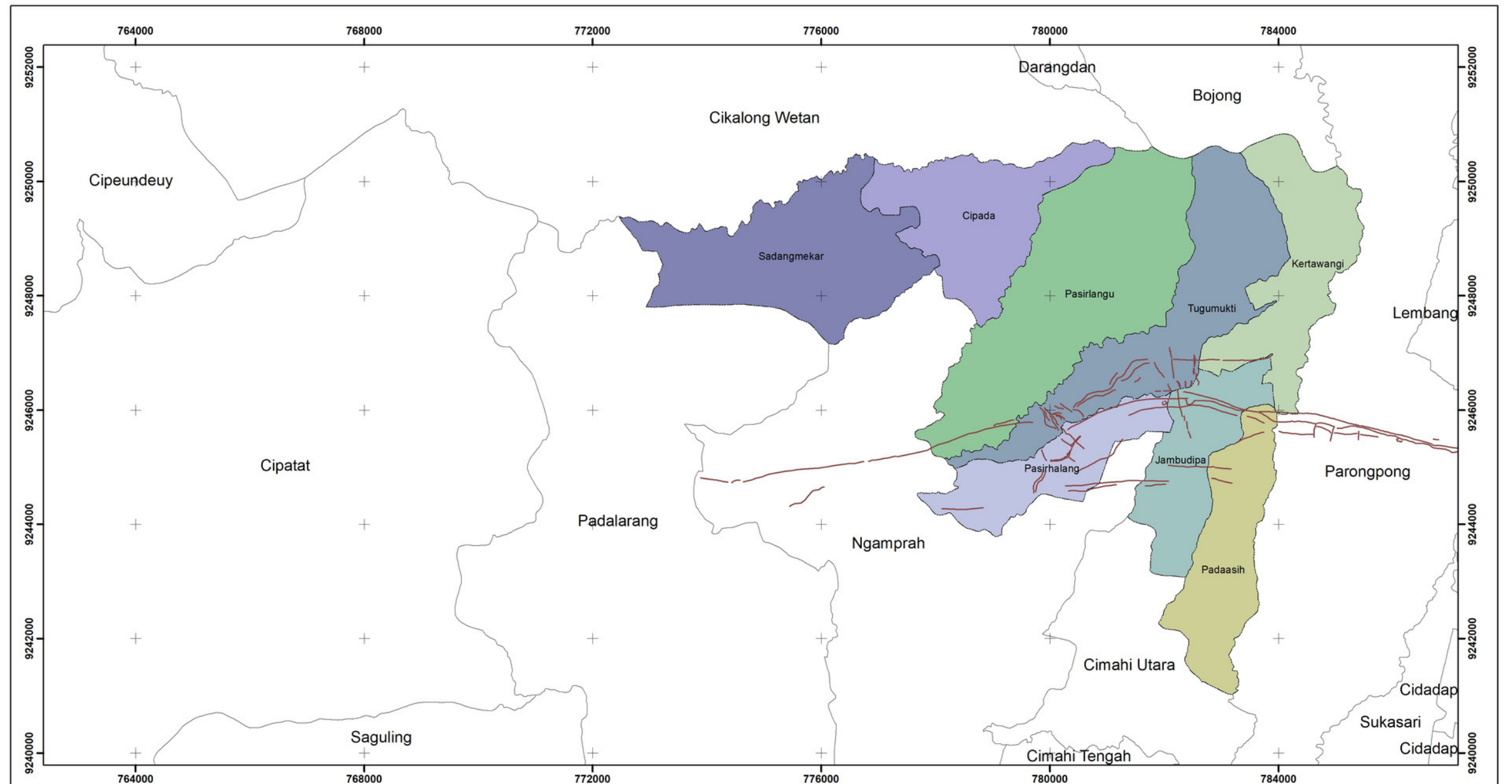


Cisarua is district affected by the earthquake

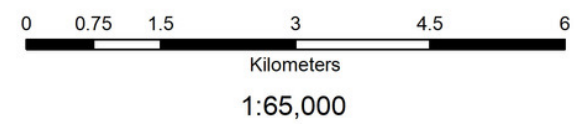


Earthquake vulnerability mapping

AREA STUDIES



ADMINISTRATIVE MAP OF CISARUA DISTRICT WEST BANDUNG REGENCY INDONESIA



Maps By Totok Doyo Pamungkas and Research Team in 2023

Legend

- Lembang Fault Trace
- Sub-district Administrative Boundaries
- District Administrative Boundaries

Spatial Reference

Datum: WGS 1984
Unit: Degree Minute Second
Projection: Universal Transverse Mercator Zone 48S

Inset Map



Mapping Area

DATA AND RESEARCH METHODS

Data Source

- **Geospatial Information Agency (BIG),**
- **Maxar Imagery,**
- **Esri Imagery,**
- **Central Statistics Agency (BPS),**
- **Geological Agency, and**
- **Cisarua District Government.**

Research Methods

This research used weighting, scoring, and overlay analysis techniques in ArcGIS 10.8 software. All indicators for each variable are scored based on the relationship between these indicators and the level of vulnerability to earthquake disasters.



SCORING AND WEIGHTING GUIDELINES

Parameter	Indicators	Score	Weight
Building Density	< 10 Building	1	4
	10 - 30 Building	2	
	30 - 50 Building	3	
	50 - 80 Building	4	
	> 80 Building	5	
Road Network	< 8 Km	1	2
	8 - 16 Km	2	
	16 - 24 Km	3	
	24 - 32 Km	4	
	32 - 40 Km	5	
Fault Distance	250 meters	1	4
	200 meters	2	
	150 meters	3	
	100 meters	4	
	50 meters	5	

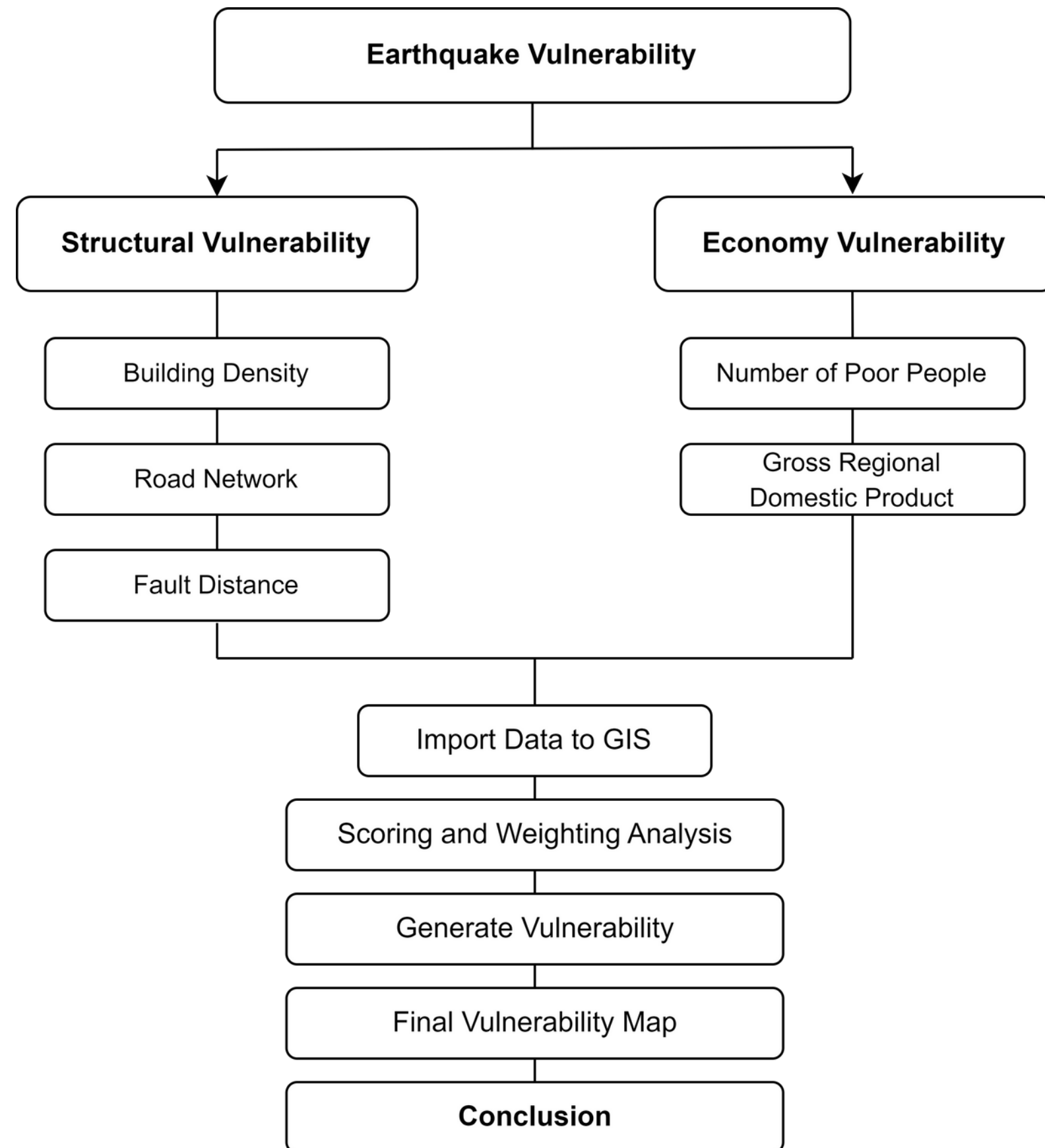
Parameter	Indicators	Score	Weight
Gross Regional Domestic Product	< 50 million	1	5
	50 - 100 million	2	
	100 - 150 million	3	
	150 - 200 million	4	
	> 200 million	5	
Number of Poor People	1300 - 1800	5	5
	1801 - 2300	4	
	2301 - 2800	3	
	2800 - 3300	2	
	> 3300	1	

PHYSICAL AND ECONOMIC VULNERABILITY CLASSIFICATION LEVELS

Parameter	Indicators	Class
Physical Vulnerability	8 - 24	Very Low
	25 - 53	Low
	54 - 77	Medium
	78 - 101	High
	> 101	Very High

Parameter	Indicators	Class
Economy Vulnerability	26 - 29	Very Low
	30 - 33	Low
	34 - 37	Medium
	38 - 41	High
	> 42	Very High

EARTHQUAKE VULNERABILITY MAPPING WORKFLOW

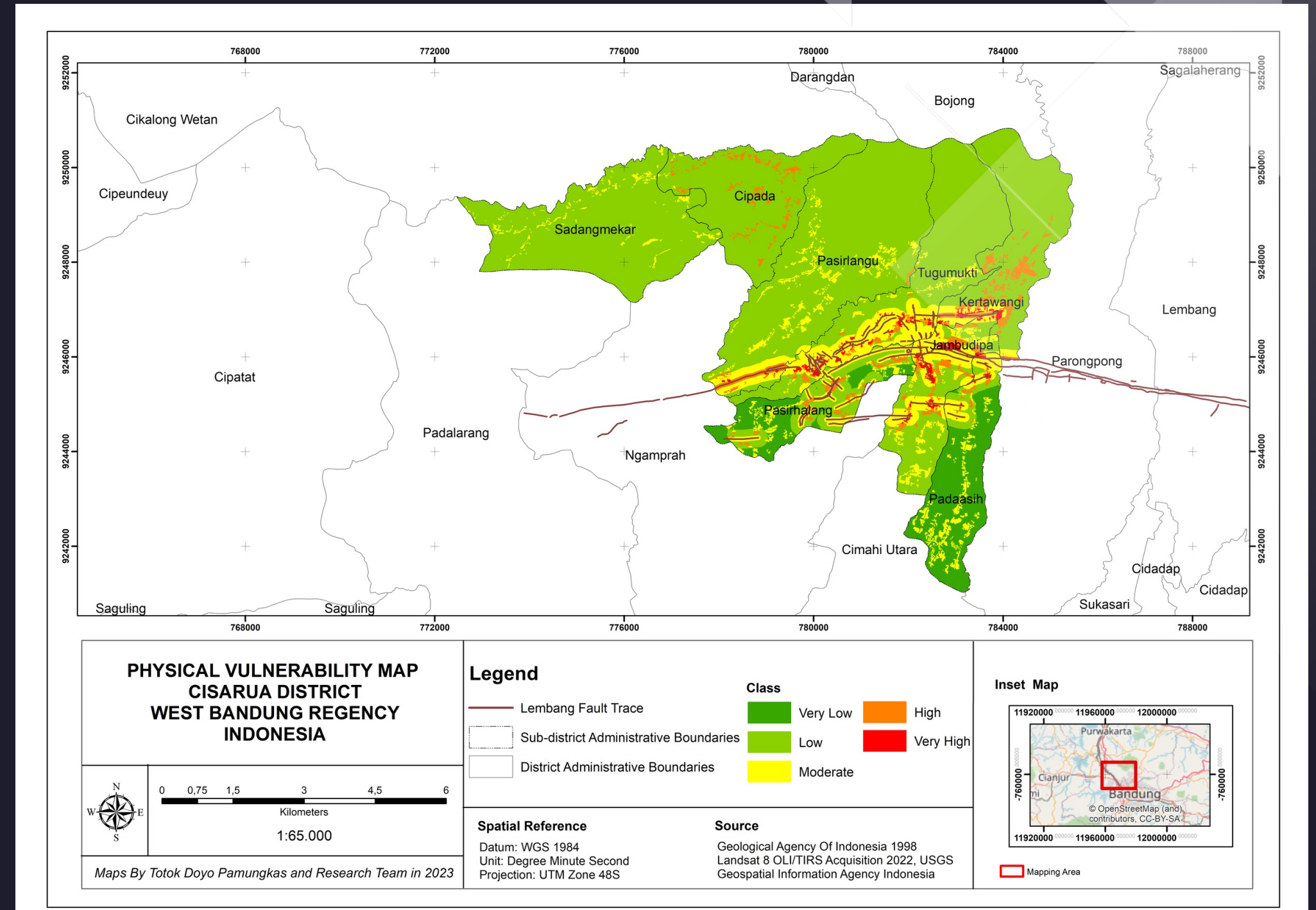


RESULTS AND DISCUSSION

Physical Vulnerability

From the overall overlay of physical vulnerability parameters, it is known that of the eight villages in Cisarua District, **Jambudipa Village** has the most **extensive level of Very High** vulnerability with a value of **21,954 Ha**. This is influenced by the **very high density of buildings** and the **close distance to the Lembang fault**

The village with the **largest area of very low vulnerability** is **Padaasih Village**, with a value of **345,700 Ha**. Even though Padaasih Village has a very high building density, **the distance from the Lembang Fault** is **quite far**. Apart from that, the **length of the road network** in Padaasih Village is categorized as **moderate**.

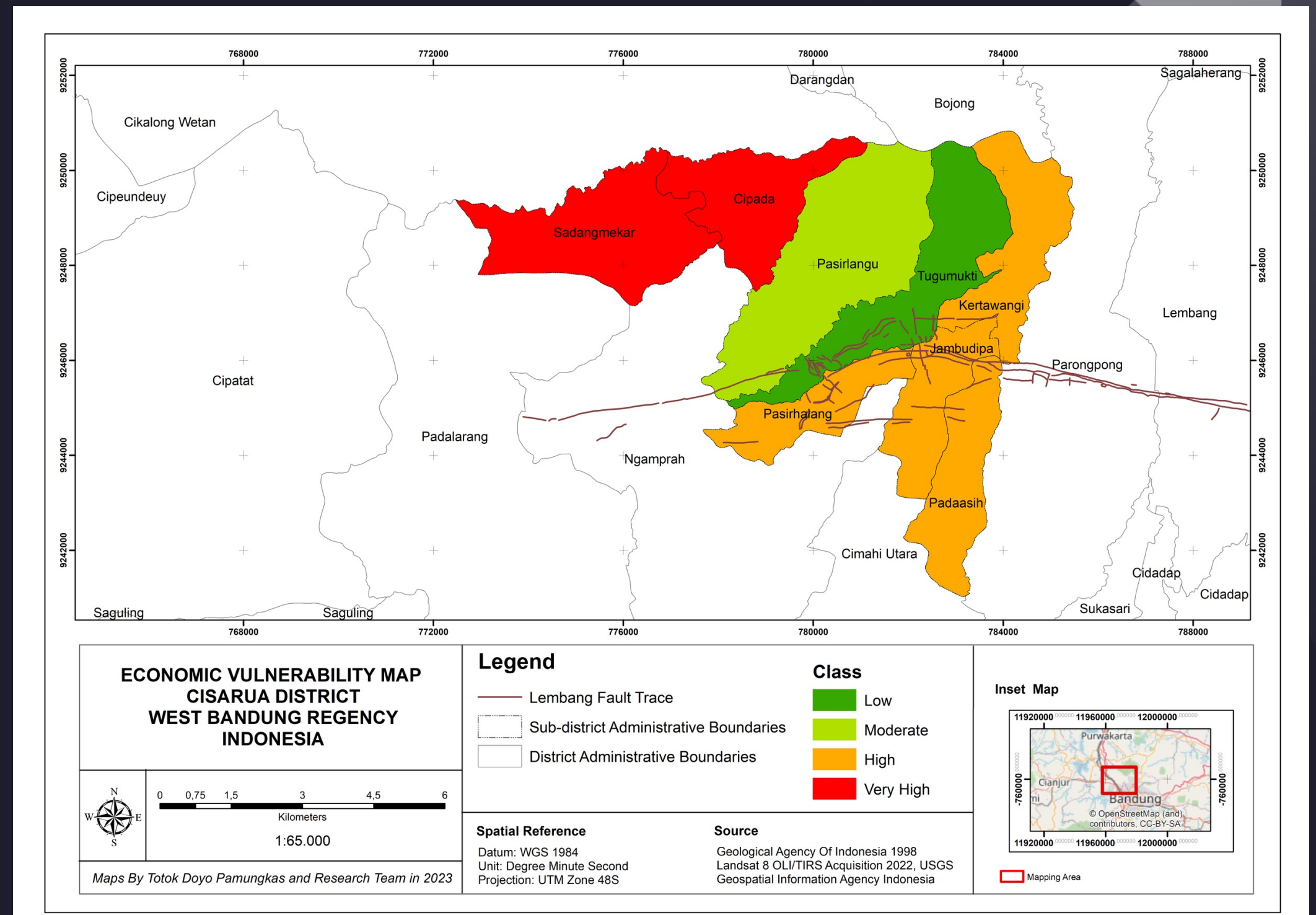


RESULTS AND DISCUSSION

Economic Vulnerability

Villages with **very high** economic vulnerability are **Sadangmekar Village and Cipada Village**. Villages with a **high level** of vulnerability are **Padaasih, Pasirhalang, Jambudipa, and Kertawangi villages**. Villages with a **moderate level** are **Pasirlangu Village** and villages with a **low level** are **Tugumukti Village**.

No	Village	GRDP (million rupiah)	Number of Poor People
1	Tugumukti	208	1337
2	Pasirhalang	200	3255
3	Sadangmekar	225	3412
4	Kertawangi	150	2865
5	Cipada	155	3818
6	Pasirlangu	313	1952
7	Padaasih	127	2908
8	Jambudipa	109	3625



CONCLUSION AND SUGGESTION

The village with the highest physical vulnerability in Cisarua District is Jambudipa Village. Meanwhile, Sadangmekar Village and Cipada Village are the villages with the highest economic vulnerability. These three villages require more attention to their physical and economic vulnerabilities in order to minimize the impacts that may arise due to earthquake disasters.

ACKNOWLEDGEMENT

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THANK YOU!