

# Integrating Geospatial Statistics: A Strategic Approach to National Challenges

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Chair of Geospatial Information Agency - Indonesia

# The Role & Function of BIG: *to carry out government duties in the field of Geospatial Information*

BIG has wider duties and functions, not only coordinate and implement activities in surveying and mapping, but also produce the Geospatial Information that can be accounted, accurate, reliable, and easily accessible.

REGULATOR

Formulate policies and prepare laws related to the implementation of development Geospatial Information



EXECUTOR

Single Provider for Basic Geospatial Information (IGD), Article 22.

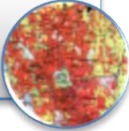
COORDINATOR

Coordinate the development and integration of Thematic Geospatial Information.



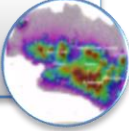
- IGD is a geo-reference frame for IGT to ensure the alignment of National Geospatial Information

IGD Development



- BIG coordinate the preparation of integrated IGT based on the norms, standards, and guidelines set by BIG

IGT Development



- To fulfill the mandate that the Geospatial Information is easily accessible, BIG build JIGN as an umbrella law that strengthens Presidential Decree

IIG Development



Reference of Thematic Geospatial Information Development

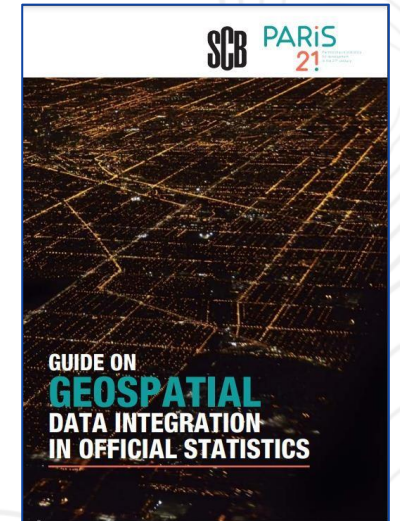
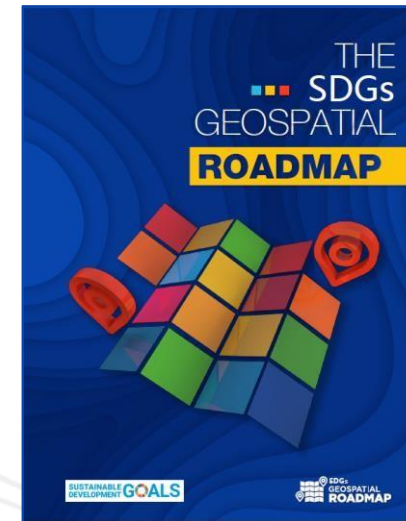
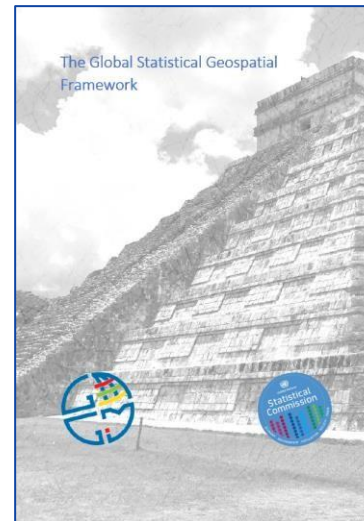
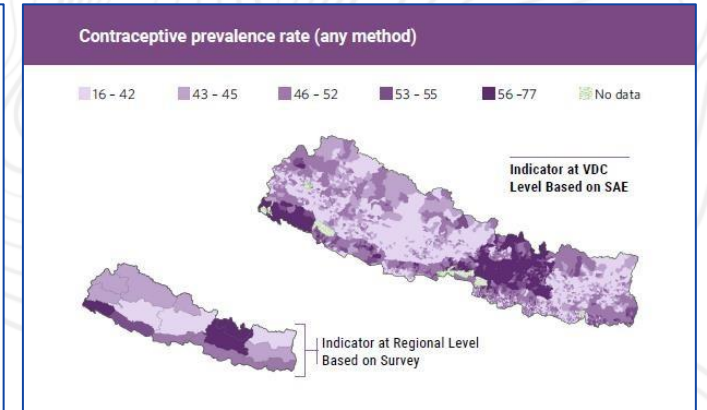
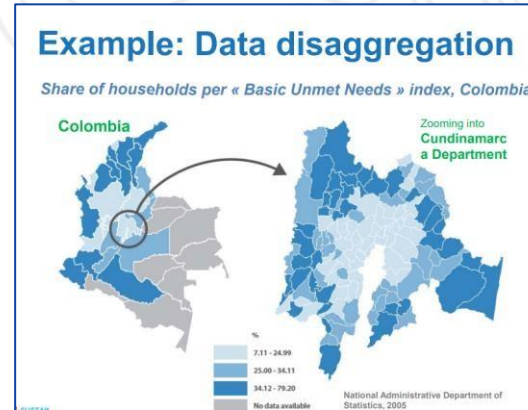
Fostering and Integration of Thematic Geospatial Information

Sharing and Dissemination of Geospatial Information

# Background

The disaggregation of statistical data into small geographical units which is related to the principle of Leave No One Behind, has become a global issue in the measurement of SDGs indicators.

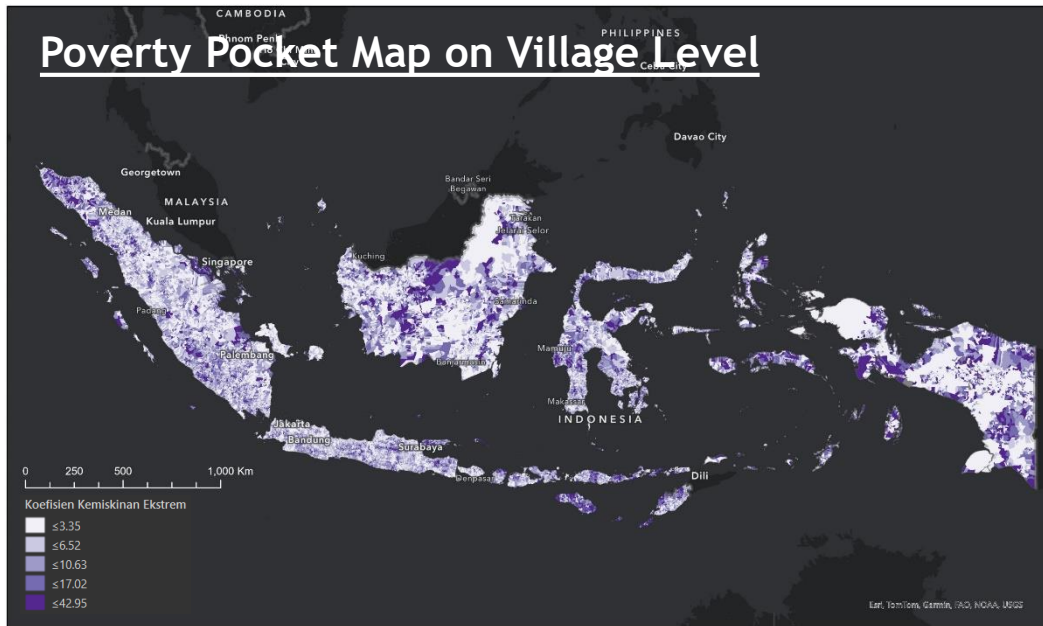
The statistical spatial integration activity was held to support the provision of SDGs indicator data in village administration units in Indonesia.



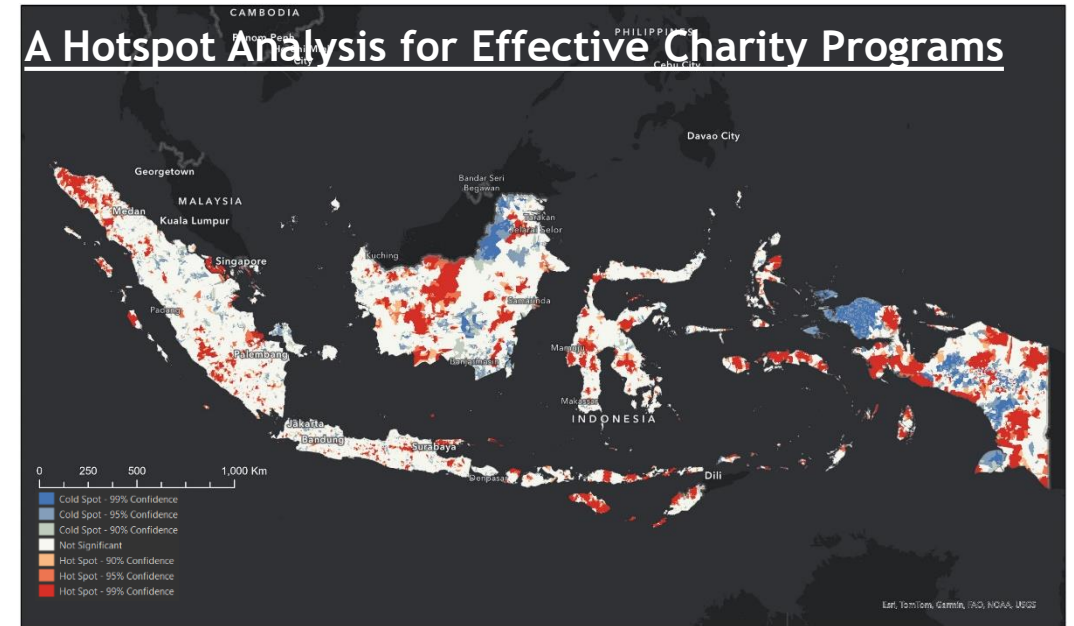
Dokumen-dokumen UN-GGIM terkait integrasi data statistik dan informasi geospasial



# Spatial Distribution of Extreme Poverty Levels at the Village Level



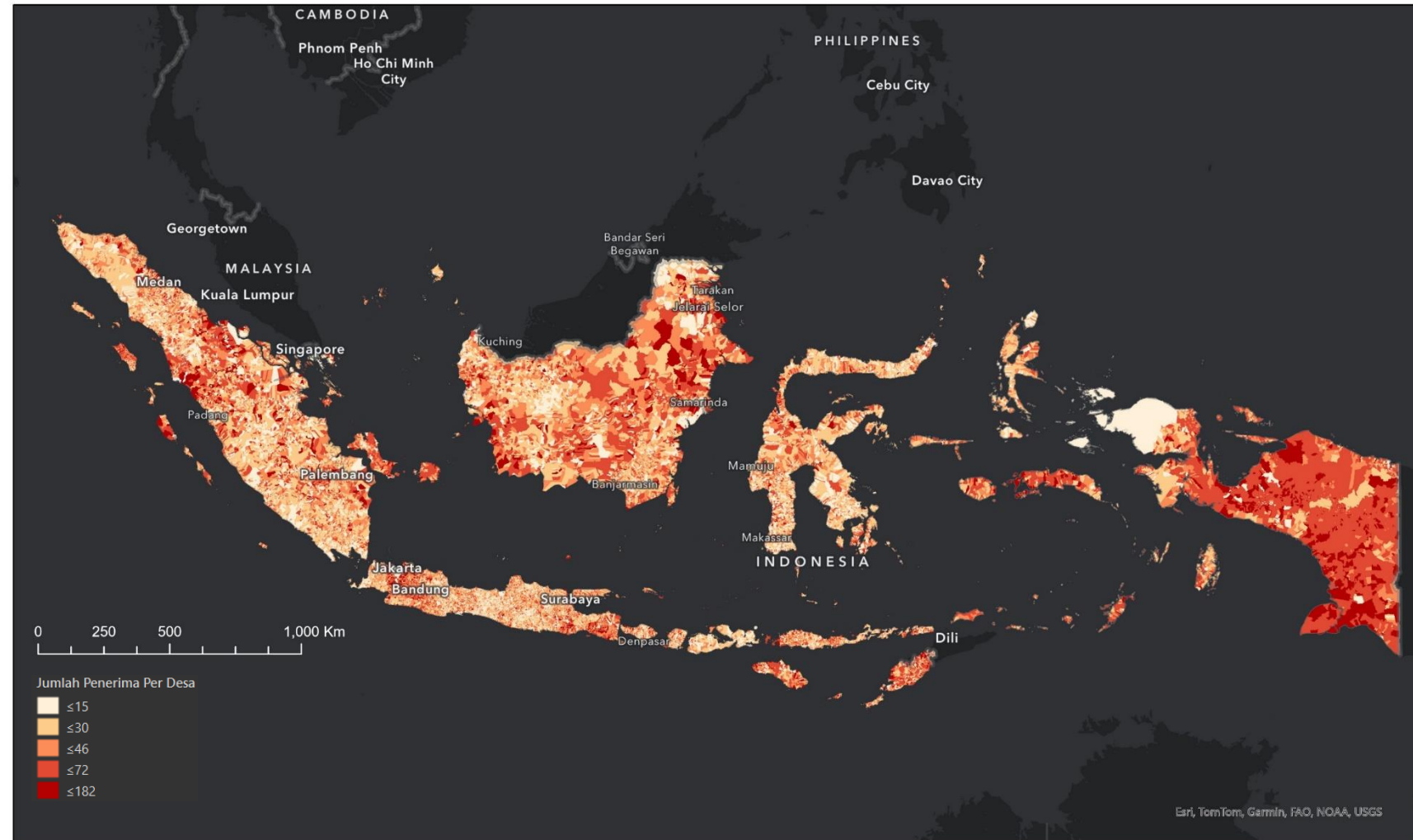
- Villages with a deep purple color represent those with a high extreme poverty coefficient compared to other villages with lighter colors.
- Assistance is prioritized for villages with high coefficient values as well as those that have the nearest neighboring relationships.



- The Extreme Poverty Hotspot Map clusters priority villages for aid recipients (in red) so that the distribution of assistance is more efficient.

# Map of Beneficiary Families of Direct Cash Assistance at the Village Level

- Villages with a deep red color represent those with a higher number of Beneficiary Families of Direct Cash Assistance (KPM BLT) compared to other villages with lighter colors.
- A comparative analysis between the Extreme Poverty Pocket Map and the KPM BLT Map can be used as one way to evaluate the assistance program.

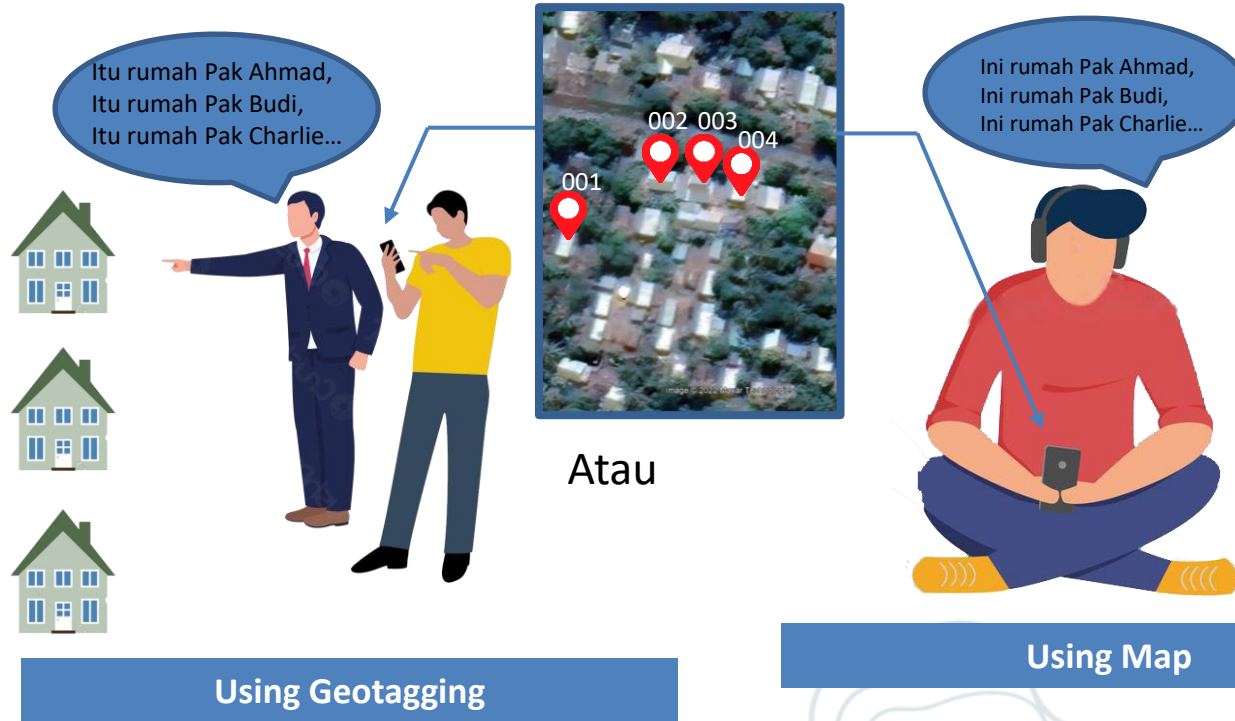




# Geospatial-Based Family Data Collection

Build Family Database

*“by Name by Address by Coordinate”*



*“Updating”*



Data for assistance program

*“Verification”*



Social Assistance Program

# SPATIAL ANALYSIS IN THE PROVISION OF SOCIAL ASSISTANCE IN PARAKAN VILLAGE, CIOMAS DISTRICT, BOGOR REGENCY

## Spatial Analysis of Social Status in Parakan Village

### Data:

- a. Population: 9.740 people
- b. Non-Poverty Household: 4.344 Families
- c. Poverty Household : 1.344 Families

Through this spatial analysis, it can help the government determine the right targets in the provision of social assistance.



GA002000	
FID	972
FCODE	GA002000
LCODE	GA0020
NAMOBJ	Rumah
REMARK	GA002000
SRS_ID	
UPDATED	20151230
OBJECTID_1	1353
Penghuni	4
Pekerjaan	Karyawan Swasta
Miskin	0
PUS	1
KB	1
Nama_KK	
Alamat	
Status_Sos	Tidak Miskin
No_KK	0
Sanitasi	1
Jamban/Kamar mandi	Ada

GA002000	
FID	1191
FCODE	GA002000
LCODE	GA0020
NAMOBJ	Rumah
REMARK	GA002000
SRS_ID	
UPDATED	20151230
OBJECTID_1	1646
Penghuni	5
Pekerjaan	Pensiunan
Miskin	1
PUS	1
KB	0
Nama_KK	
Alamat	
Status_Sos	Miskin
No_KK	0
Sanitasi	1
Jamban/Kamar mandi	Ada

Keterangan:	
-----	Batas Desa Parakan
—	Jalan
Status Sosial	
■	Tidak Miskin
■	Miskin
Penggunaan Lahan	
■	Perkebunan/Kebun
■	Permukaan/Lapangan Diperkeras
■	Sawah
■	Semak Belukar
■	Tanah Kosong/Gundul
■	Tegalan/Ladang
■	Bangunan non Permukiman
■	Tempat Ibadah
■	Pemukaman
■	Posyandu
■	Lapangan
■	Tubuh Air

Sumber:

- Profil Desa dan Kelurahan, 2019  
- Hasil Perhitungan 2020

Badan Informasi Geospasial

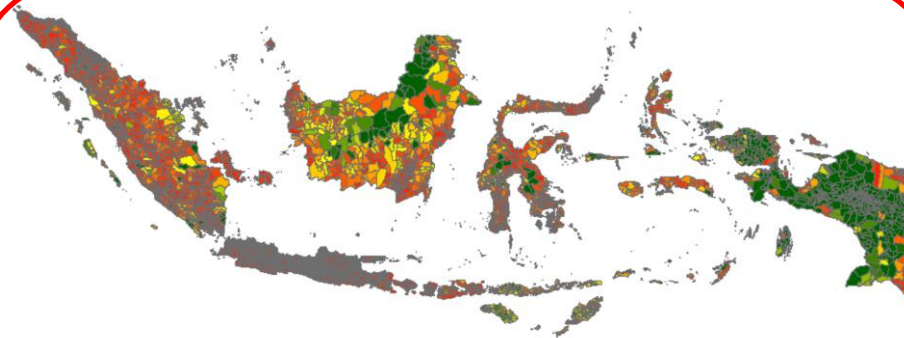
Badan Informasi Geospasial

Badan Informasi Geospasial



# Utilization of GI for the Distribution of Educational Scholarships

- Integration of Geospatial Statistics and Geostatistics can produce IGT Analysis for location-based scholarship needs.
- For future proposals should include projections or modelling of spatial dynamics for education.



Social Infrastructure Map

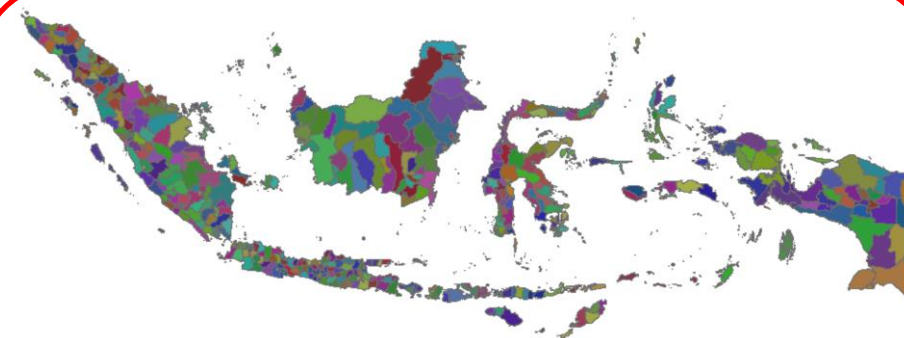


Schools Geotagging



Scholarship Program

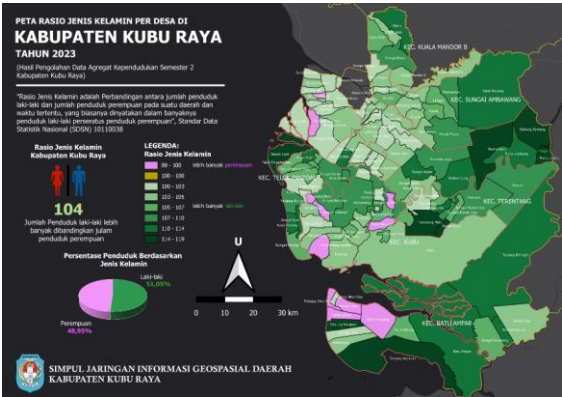
School Age Statistics by  
Village



Village Map



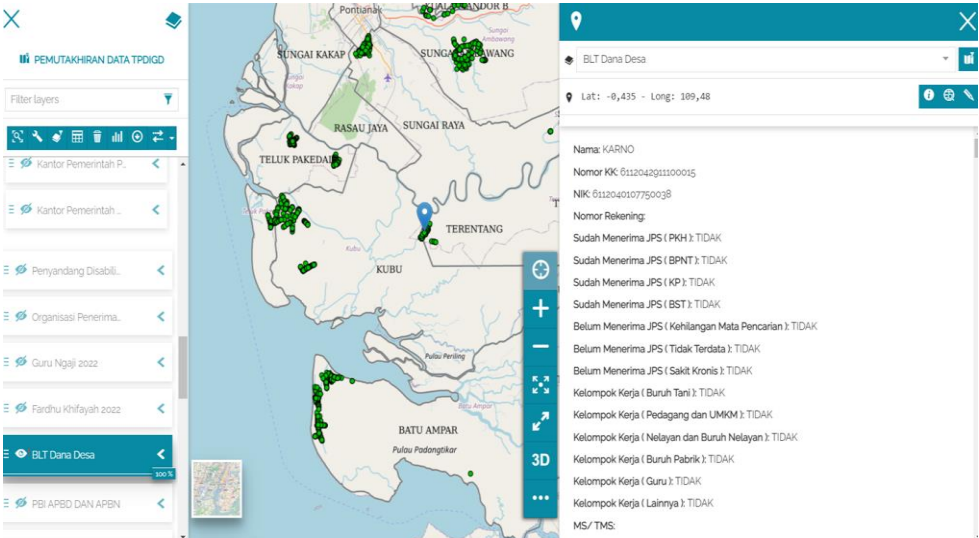
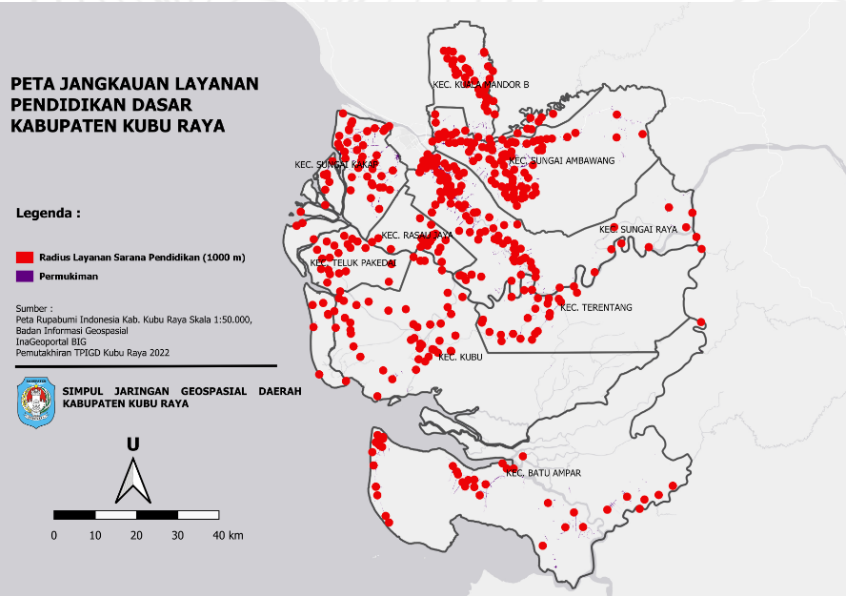
# SUPPORT FROM THE REGIONAL GOVERNMENT OF KUBURAYA FOR EDUCATION SERVICE PROGRAMS



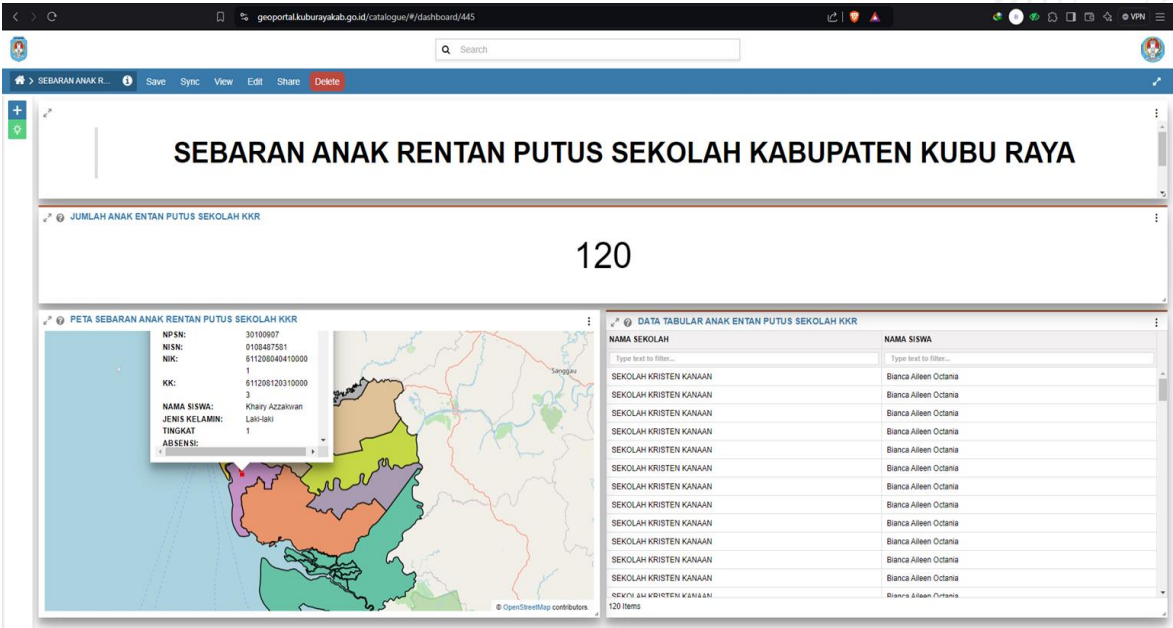
Population Map

Elementary School

Radius 1 km



Geospatial Data for Social Assistance Program



# Integration Data for Reducing Family Stunting Prevalence Potential Risk

## *Capturing Data (Spatial and Statistics)*

- Recording Stunting Data Indicators
- Household-based data Census
- Geocoding data (coordinates, address, administration)



x- and y- coordinates



Addresses



Functional Areas





# Dashboard on Stunting Indicators



## Dashboard Stunting dan Keluarga Beresiko Stunting

Indikator: Persentase Keluarga Beresiko Stunting | Wilayah: Indonesia

**Daftar Indikator [12]**

Pilih Indikator

Persentase Keluarga Beresik...

**TAMPAIKAN**

**Pilih Wilayah**

Provinsi

Semua

Kabupaten/Kota

Semua

Kecamatan

Semua

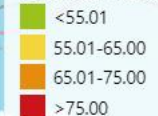
Desa

Semua

**PERBARUI**

### Legenda

Persentase Keluarga Beresiko Stunting



95° 00' 00" E

100° 00' 00" E

105° 00' 00" E

110° 00' 00" E

120° 00' 00" E

125° 00' 00" E

130° 00' 00" E

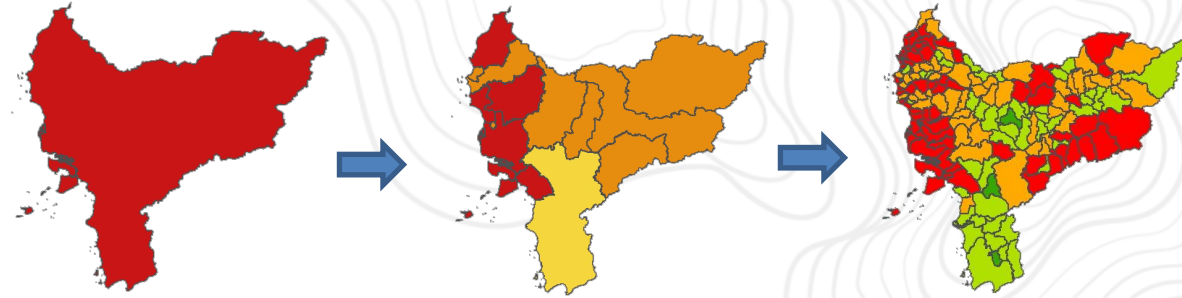
135° 00' 00" E

140° 00' 00" E

145° 00' 00" E

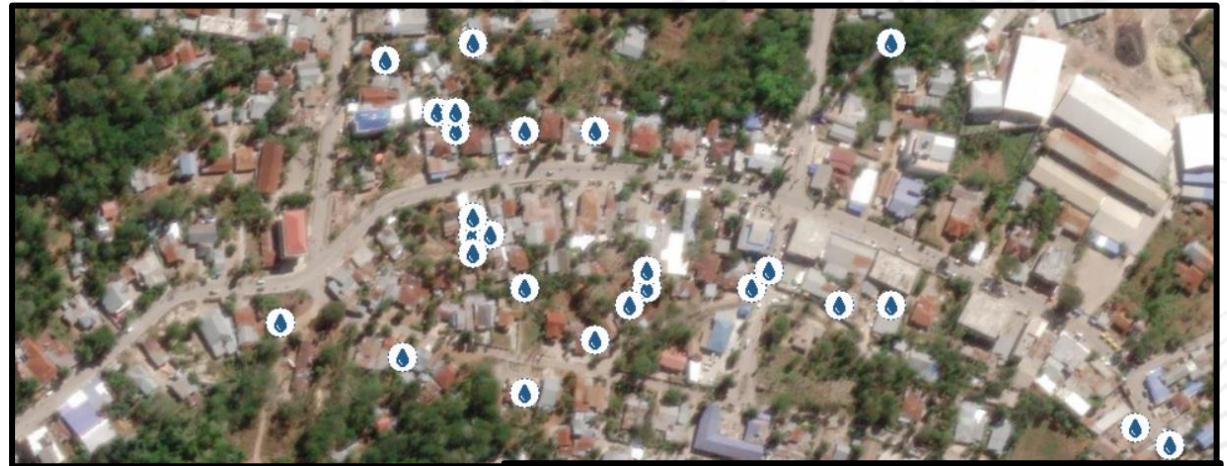


# SDGs Mapping



- To obtain data that can be used to compile village-level SDGs indicators, BIG is trying to build cooperation with several related ministries/agencies, one of which is with the National Population and Family Planning Agency (BKKBN).
- Family Data Collection activities organized by BKKBN, produce statistical data in household units so that aggregation can be carried out to the village administration level.

Enhancement Data Accuracy



Houses with inaccessibility for clean water

The Spirit “**No One Left Behind SDGs**” are adopted to improve the family census 21 (PK21) data in more detail unit, **Village** and **household levels**



# Mapping for SDGs Indicator



**"Integration of Geospatial and Statistical Data has enabled the reporting of 22 indicators for the Sustainable Development Goals (SDGs)."**

1. Indicator 1.2.2.
2. Indicator 1.4.2.
3. Indicator 3.7.1.
4. Indicator 3.8.2.
5. Indicator 4.1.2.
6. Indicator 4.1.2. (a)
7. Indicator 4.3.1.
8. Indicator 4.3.1. (a)
9. Indicator 4.5.1.
10. Indicator 5.2.1.
11. Indicator 5.3.1.
12. Indicator 6.1.1.
13. Indicator 6.2.1.
14. Indicator 7.1..
15. Indicator 7.1.2. (b)
16. Indicator 8.3.1.
17. Indicator 8.6.1.
18. Indicator 11.1.1. (a)
19. Indicator 11.2.1.(a)
20. Indicator 11.3.1. (a)
21. Indicator 17.8.1
22. Indicator 8.6.1.

# Calculation for Indicator 11.2.1.(a)

Perform the calculation of the 11.2.1 indicator. (a) Percentage of the population with convenient access to public transportation as a follow-up to the UN-HABITAT Workshop

## METODE PERHITUNGAN

### Cara perhitungan:

Jumlah penduduk yang memiliki akses transportasi umum yang nyaman dibagi dengan jumlah penduduk di wilayah yang dilayani dikali dengan seratus, dinyatakan dengan satuan persen (%).

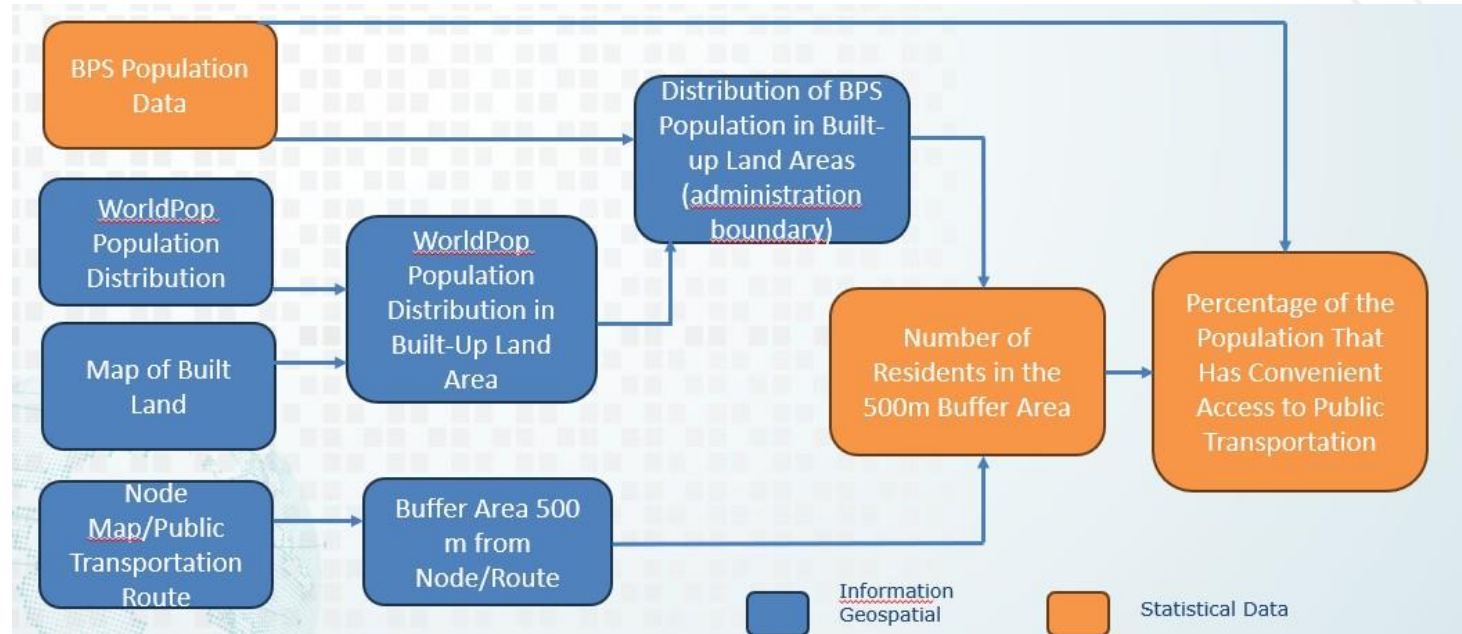
### Rumus:

$$PPTUN = \frac{JPTUN}{JP} \times 100$$

### Keterangan:

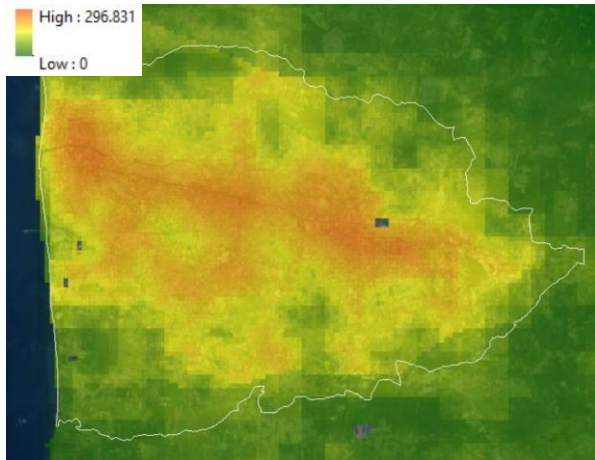
- PPTUN : Persentase penduduk yang memiliki akses nyaman (jarak 0,5 km) ke transportasi umum
- JPTUN : Jumlah penduduk yang memiliki akses nyaman (jarak 0,5 km) ke transportasi umum
- JP : Jumlah penduduk di wilayah yang dilayani

## Data Processing Methods

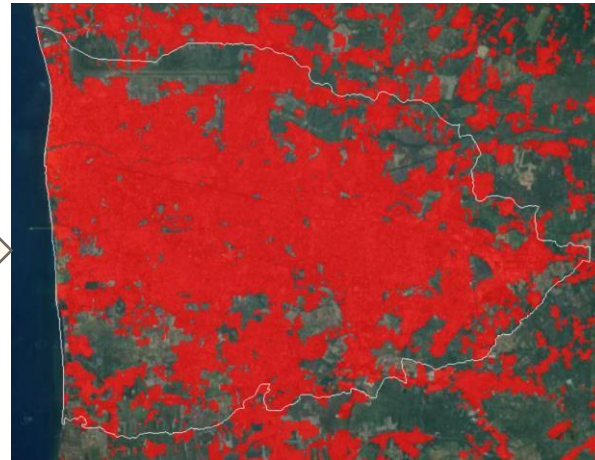




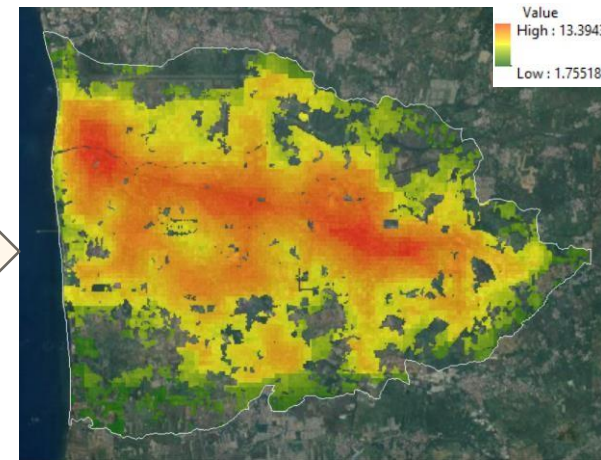
# Indicator Measurement Data Processing Method 11.2.1. (a)



Worldpop Population Distribution



Land Built 2020



Population Distribution Adjusts BPS  
Data and Built Land

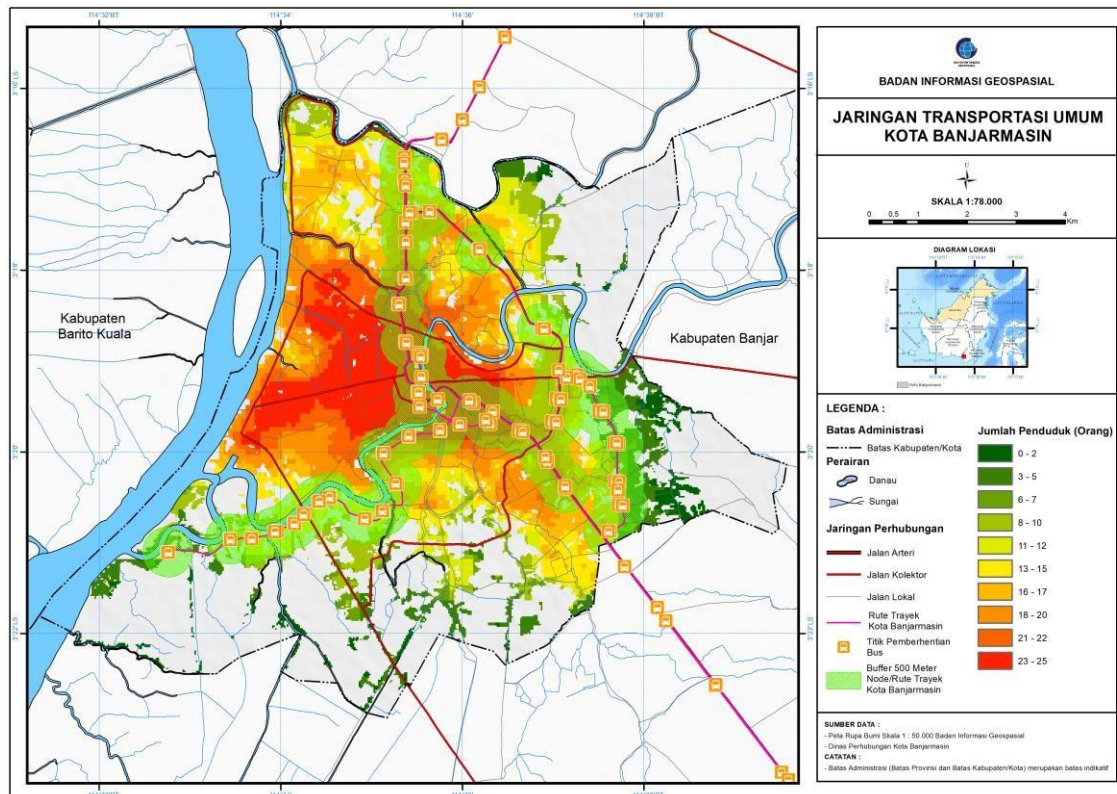


Buffer 500 meters  
from Node or Public  
Transport Route

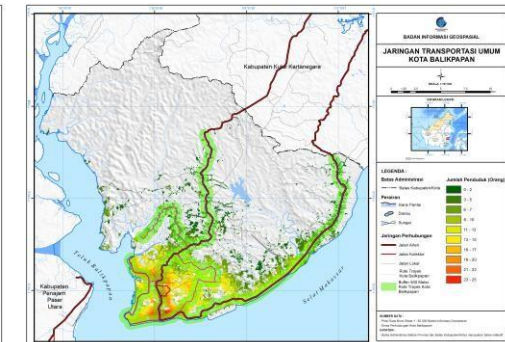
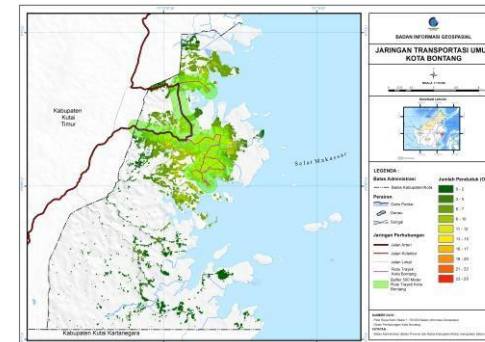


# Results of IGT Activities of Spatial-Statistical Integration Related to Statistical and Geospatial Data Analysis

Perform the calculation of the 11.2.1 indicator. (a) Percentage of the population with convenient access to public transportation



No	City	Population	Number of Population Served	Percentage of Population Served
1	Kota Banjarbaru	253440	94.977	37,48
2	Kota Banjarmasin	657660	558.305	84,89
3	Kota Pontianak	658685	573.514	87,07
4	Kota Singkawang	235064	143.637	61,11
5	Kota Palangkaraya	293457	126597	43,14
6	Kota Bontang	178900	93985	52,53
7	Kota Samarinda	828000	412147	49,78
8	Kota Balikpapan	688300	420568	61,10
9	Kota Tarakan	242800	193.874	79,85





# Indicator 11.3.1. (a) Ratio of the rate of expansion of built land to the rate of population growth

KEMENTERIAN PERENCANAAN PEMBANGUNAN NASIONAL/  
BADAN PERENCANAAN PEMBANGUNAN NASIONAL  
REPUBLIK INDONESIA

DIREKTORAT PEMBANGUNAN DAERAH

NOTA DINAS  
NOMOR 200/PP.10.01/02/2023

Yth. : (Daftar Terlampir)  
Dari : Direktur Pembangunan Daerah selaku Ketua Sub Pokja Tujuan 11 SDGs  
Hal : Permohonan Data Sektoral Capaian SDGs 2022 untuk Penyusunan  
Laporan Tahunan Pelaksanaan TPB/SDGs 2022  
Tanggal : 15 Februari 2023  
Lampiran : 3 (tiga) berkas

Lampiran III Nota Dinas  
Nomor : 200/PP.10.01/02/2023  
Tanggal : 15 Februari 2023

Daftar Indikator TPB/SDGs 2022 untuk Tujuan 11. Kota dan Permukiman yang Berkelanjutan

No	Kode Indikator	Nama Indikator SDGs	Tahun	Disregresi Wilayah	Sumber Data	Keterangan
11.3 Pada tahun 2030, memperkuat urbanisasi yang inklusif dan berkelanjutan serta kapasitas partisipasi, perencanaan Penanganan permukiman yang berkelanjutan dan terintegrasi di semua negara.						
1	11.3.1.(a) **	Rasio laju perluasan lahan terbangun terhadap laju pertumbuhan penduduk	2015 - 2022	<ul style="list-style-type: none"> <li>Nasional</li> <li>Provinsi</li> <li>Kabupaten/Kota</li> </ul>	Badan Informasi Geospasial (BIG)	Dit. Tata Ruang, Pertanahan, dan Penanggulangan Bencana
11.4 Mempromosikan dan menjaga warisan budaya dunia dan warisan alam dunia.						



## CALCULATION METHOD

The rate of land expansion built in a certain period of time is divided by the rate of population growth in the same period

Formula

$$RLTPP = \frac{LPLT}{LPP}$$

Information

RLTPP : Ratio of the rate of land expansion built up to the rate of population growth  
LPLT : The rate of land expansion was built in the period XXXX-YYYY  
LPP : Population growth rate in the period XXXX-YYYY

## BENEFIT

Monitoring the effect of population growth on urban land conversion as a way to see whether land use is carried out efficiently or not

## DATA SOURCES

Badan Informasi Geospasial.

## DISAGREGATION

- Administrative area: national, provincial and regency/city.
- Land cover map 1:50k scale Java, Bali, Nusa Tenggara, Sulawesi, Maluku, Papua

## FREQUENCY OF DATA COLLECTION

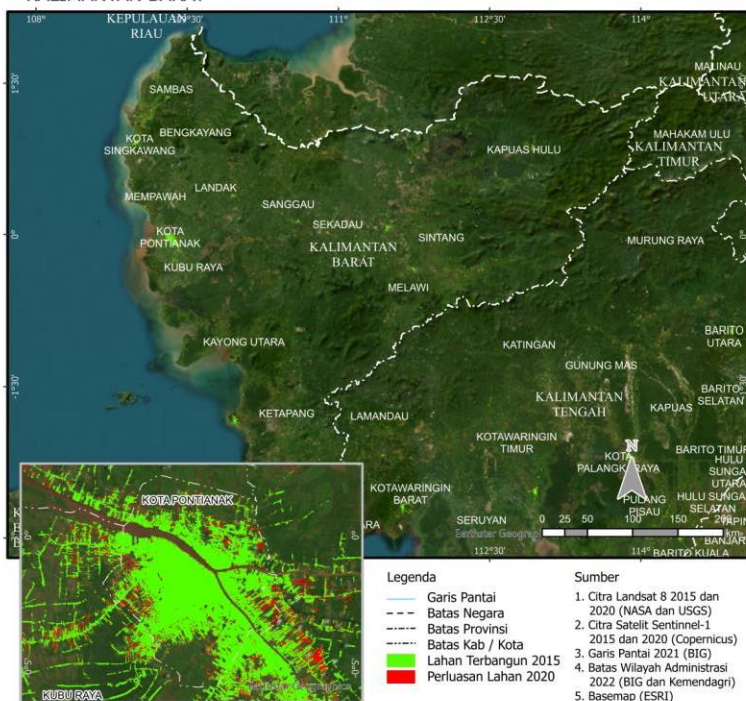
Every 5 years



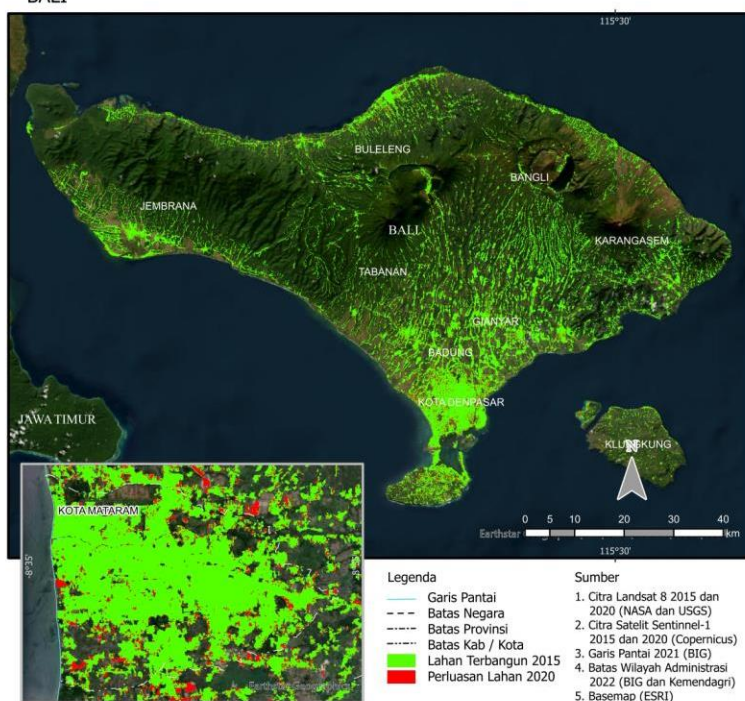
# Analysis of the Built Land Expansion Map using:

1. Landsat (NASA & USGS)
2. Sentinel-1 (Copernicus)
3. Coastline Map (BIG)
4. Administrative Area Boundaries Map (Ministry of Home Affairs and BIG)
5. Basic Map of Indonesia's Terrain (BIG)

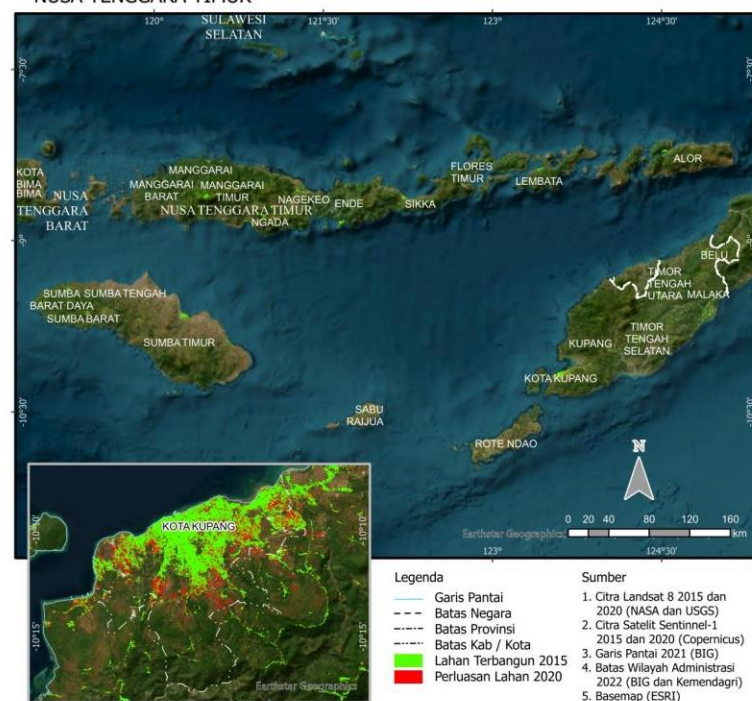
**PETA PERLUASAN LAHAN TERBANGUN**  
KALIMANTAN BARAT



**PETA PERLUASAN LAHAN TERBANGUN**  
BALI

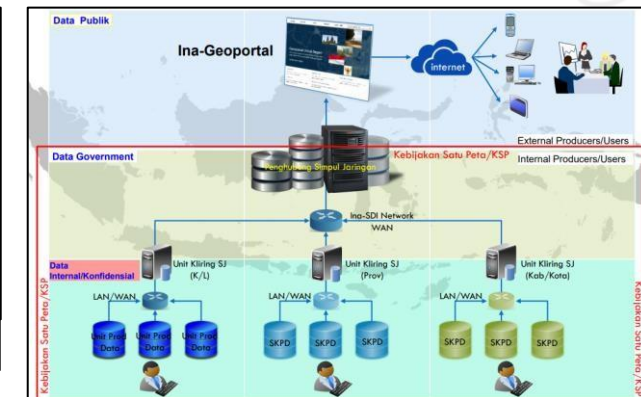
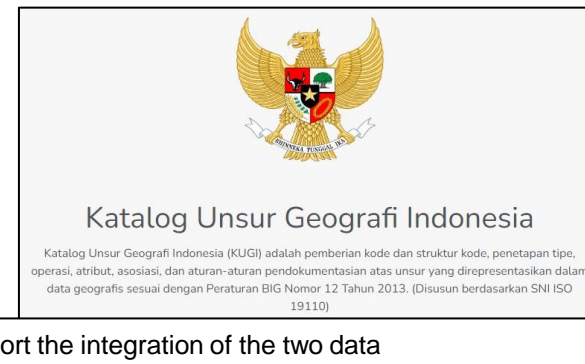
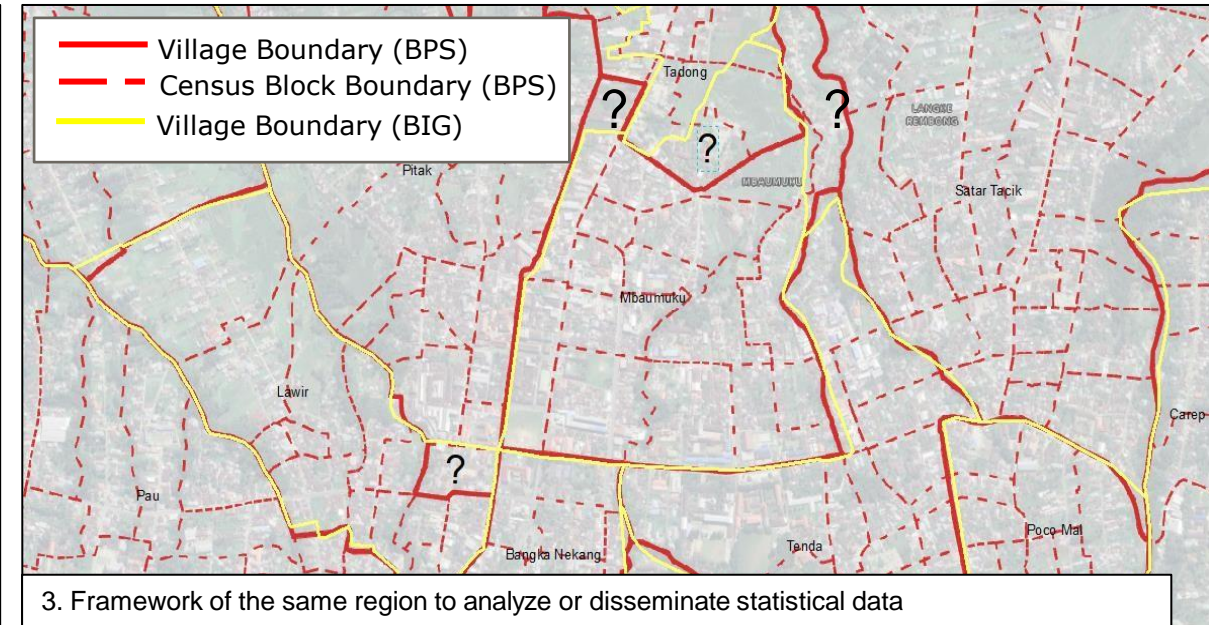
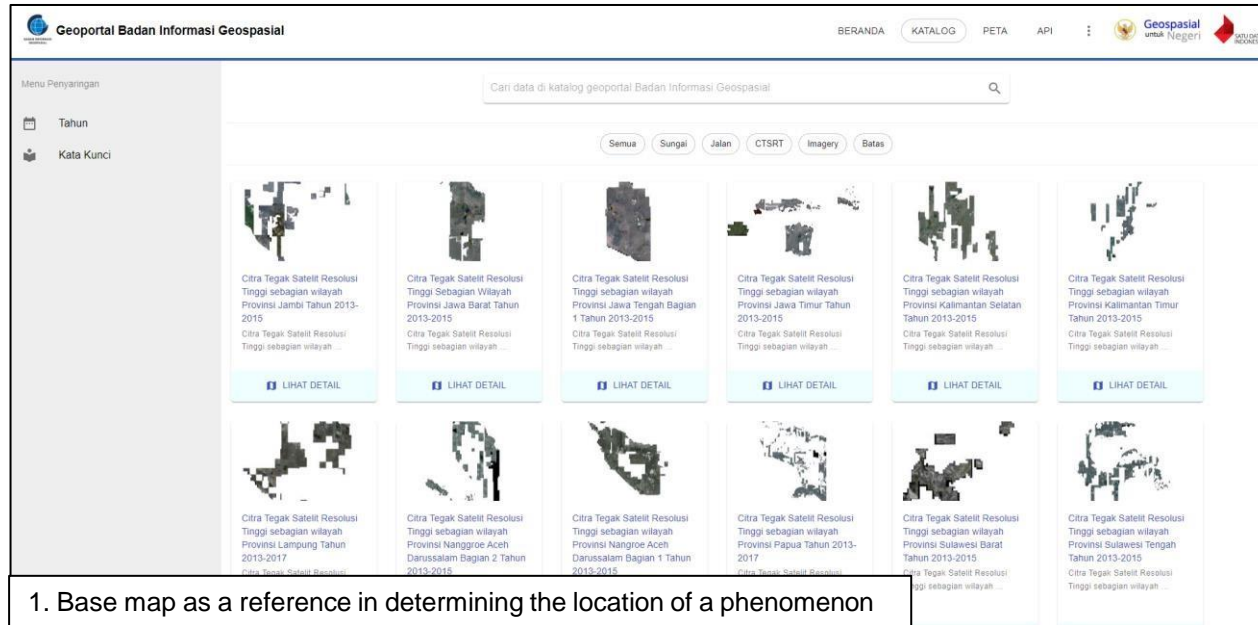


**PETA PERLUASAN LAHAN TERBANGUN**  
NUSA TENGGARA TIMUR





# Subsequent Spatial-Statistical Integration?





# Terima Kasih