



# INTEGRATING LAND AND SEA FOR SPATIAL PLANNING IN A COASTAL AREA: A CASE STUDY OF INDONESIA

► Presented By:  
**DR. Andri Supriatna, ST, M.Sc**



Directorate of Survey and Thematic Mapping

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Badan Informasi Geospasial

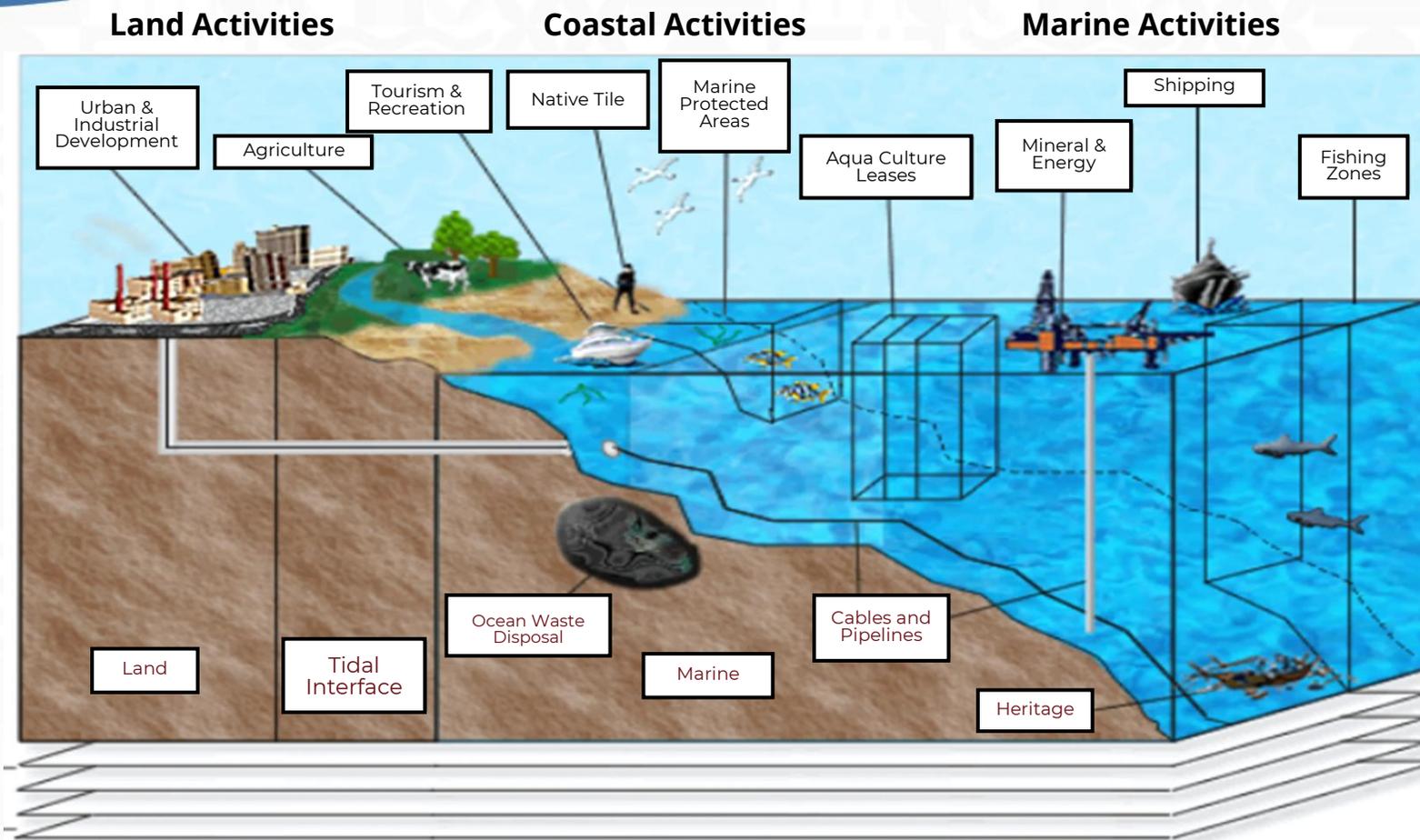


@infogeospasial



## Key Principles

- ▶ Land and Sea Integrated
- ▶ Zoning Regulation
- ▶ Public Participation
- ▶ Clean and Clear Cadastre Data



Marine Cadastre Concept Diagram, Abba Rajabifard, et al 2014

## Challenges

- ▶ Environmental Degradation
- ▶ Conflict Interest
- ▶ Urbanization
- ▶ Coastal Disaster

## Sustainable Development



## THE IMPORTANCE OF SPATIAL PLANNING IN COASTAL AREAS

### BACKGROUND

- Indonesian's coastal line: 99.093 km<sup>2</sup>;
- Coastal activities: tourism, fishing, industry, many more;
- Biodiversity;
- Disaster Risk Management;
- SDG's, Blue Economy.

### REGULATIONS

- 1 **Law No. 26 of 2007** on Spatial Planning
- 2 **Law No. 27 of 2007** (amended by Law No. 1 of 2014) on the Management of Coastal Areas and Small Islands
- 3 **Law No. 6 of 2023**, on concerning Job Creation
- 4 **Law No. 21/2021** (PP) Number 21/2021 concerning Implementation of Spatial Planning
- 5 **Local Regulations** (e.g., RTRW, RDTR)
- 6 **Regulations of The Minister of Agrarian and Spatial Planning 18/2021** concerning Procedures for Determining Management Rights and Rights of Land
- 7 **Regulation of Minister of Agrarian and Spatial Planning/ Head of the National Land Agency No. 13/2021** Implementation of the Confirmity of Space Utilization Activites and Synchronization of Space Utilization Programs

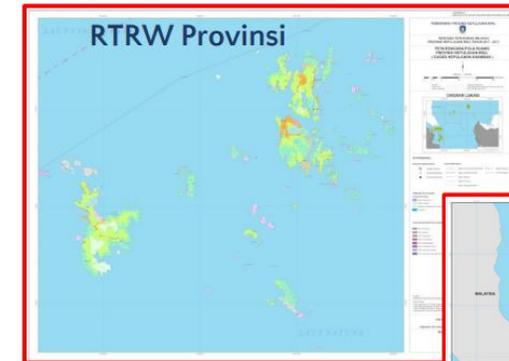




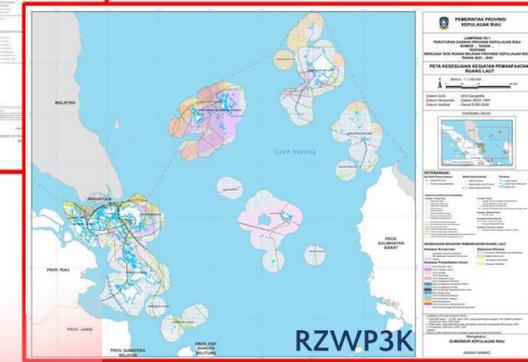
# Integration of Land and Sea Spatial Planning after Law No. 6/2023, concerning Job Creation

Spatial planning includes land space, sea space, and air space, including space within the earth as a single entity (one spatial planning document). Management of sea and air space resources is regulated by a separate law.

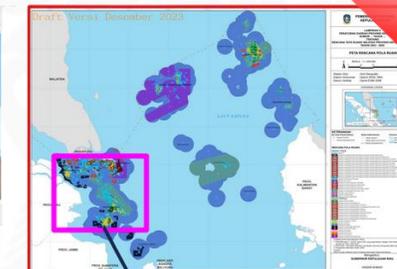
Law No. 21/ 2021 has regulated the integration of marine space technical content into one spatial planning product.



Regional Spatial Plan. space **before** the publication of UUCK



Regional Spatial Plan (RTRW) in one local regulation **after** the publication of UUCK



contains land and sea spatial plan.





RZWP3K

| RENCANA STRUKTUR RUANG LAUT                         |  |
|---|--|
| <b>Pusat Pertumbuhan Kelautan</b>                   |  |
| 1.  | Pusat Pertumbuhan Kelautan dan Perikanan |
| 2.  | Pusat Industri Kelautan dan Perikanan    |
| <b>Sistem Jaringan Transportasi</b>                 |  |
| 1.  | tatanan kepelabuhanan nasional           |
| 2.  | pelabuhan lainnya                        |
| 3.  | alur pelayaran                           |
| <b>Sistem jaringan energi dan ketenagalistrikan</b> |  |
| 1.  | pipa bawah laut minyak dan gas bumi      |
| 2.  | pipa fluida lainnya*                     |
| 3.  | instalasi minyak dan gas bumi            |
| 4.  | kabel bawah laut untuk ketenagalistrikan |
| <b>Sistem jaringan telekomunikasi</b>               |  |
| 1.  | kabel bawah laut untuk telekomunikasi    |
| 2.  | kabel bawah laut untuk mitigasi bencana  |
| <b>Sistem jaringan sumber daya air**</b>            |  |
| 1.  | sumber air                               |
| 2.  | prasarana sumber daya air                |

### INTEGRASI STRUKTUR RUANG LAUT DAN DARAT DALAM RTRWP

(penyesuaian dengan Permen KP No. 28/2021 Penyelenggaraan Penataan Ruang Laut dan Permen ATR/BPN No. 14/2021 Pedoman Penyusunan Basis Data RTRW Provinsi)

| RENCANA STRUKTUR RUANG   |  |
|--|--|
| <b>Sistem Pusat Permukiman (PKN, PKW, PKSN dan PKL)</b>                          |  |
| <b>Sistem jaringan transportasi (termasuk pelabuhan laut dan alur pelayaran)</b> |  |
| <b>Sistem jaringan energi</b>  |  |
| <b>Sistem jaringan telekomunikasi</b>  |  |
| <b>Sistem jaringan sumber daya air</b>   |  |
| <b>Sistem jaringan prasarana lainnya</b>   |  |

RTRWP

**Catatan :**

\* Pipa fluida lainnya dapat diintegrasikan ke dalam struktur ruang RTRWP sesuai dengan jenis fluidanya.

\*\*Sistem jaringan sumber daya air dalam RZWP3K dapat dipadankan dengan sistem jaringan sumber daya air atau dengan sistem jaringan prasarana lainnya, tergantung jenis jaringannya.

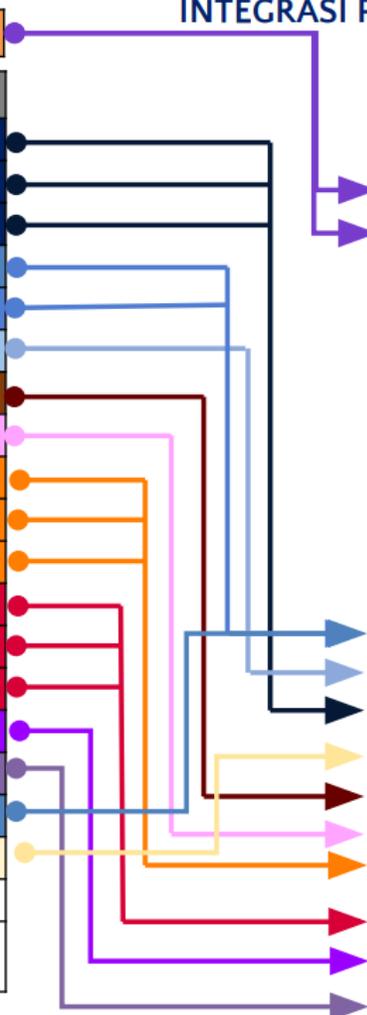




## INTEGRASI POLA RUANG LAUT DAN DARAT DALAM RTRWP

RZWP3K

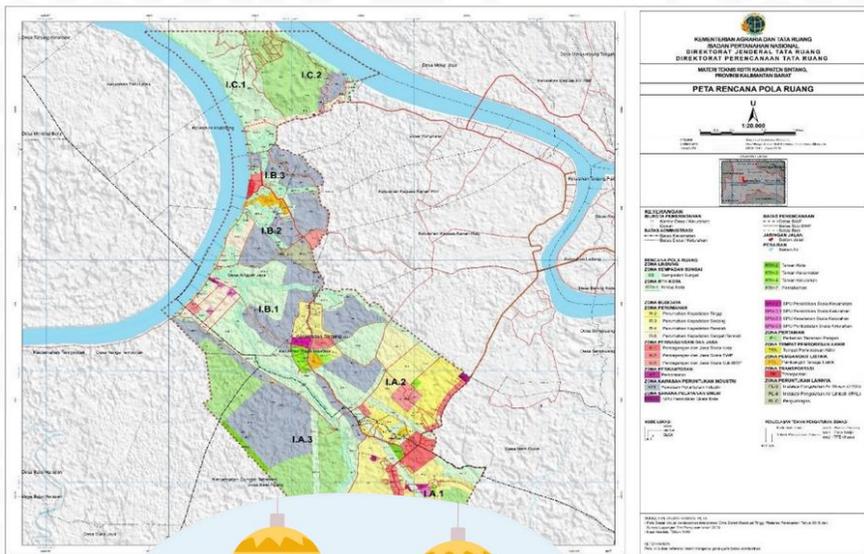
|   |
|---|
| <b>KAWASAN KONSERVASI DI LAUT</b>   |
| <b>KAWASAN PEMANFAATAN UMUM</b>   |
| Pertambangan minyak dan gas bumi  |
| Pertambangan mineral dan batu bara  |
| Pengelolaan energi  |
| Perikanan tangkap   |
| Perikanan budidaya  |
| Pergaraman  |
| Industri  |
| Pariwisata  |
| Permukiman  |
| Perdagangan barang dan/atau jasa  |
| Fasilitas umum  |
| Pelabuhan umum  |
| Pelabuhan perikanan   |
| Bandar udara  |
| Pertahanan dan keamanan   |
| Dumping area  |
| Pengelolaan ekosistem pesisir   |
| Pemanfaatan air laut selain energi  |
| Wilayah kelola Masyarakat Hukum Adat                                      |
| Pemanfaatan lainnya sesuai dengan karakteristik biogeofisik lingkungannya |



|  |
|--|
| <b>KAWASAN PERUNTUKAN LINDUNG</b>                                |
| Kawasan yang memberikan perlindungan terhadap kawasan bawahannya |
| Kawasan perlindungan setempat                                    |
| Kawasan konservasi   |
| <i>Kawasan pencadangan konservasi di laut*</i>                   |
| Kawasan hutan adat   |
| Kawasan lindung geologi  |
| Kawasan cagar budaya   |
| Kawasan ekosistem mangrove                                       |
| <b>KAWASAN PERUNTUKAN BUDIDAYA</b>                               |
| Kawasan hutan produksi   |
| Kawasan perkebunan rakyat  |
| Kawasan pertanian  |
| Kawasan perikanan  |
| <i>Kawasan pergaraman*</i>                                       |
| Kawasan pertambangan dan energi                                  |
| <i>Kawasan pemanfaatan air laut selain energi*</i>               |
| Kawasan peruntukan industri                                      |
| Kawasan pariwisata   |
| Kawasan permukiman   |
| Kawasan transportasi*  |
| Kawasan pertahanan dan keamanan                                  |
| <i>Kawasan pembuangan di laut*</i>                               |

RTRWP





## Inclusiveness of Spatial Planning Implementation

### The Member of Spatial Planning forum Consist of:

- Relevant Ministries/Departments;
- Professional Associations
- Academic Associations
- Community Leaders

### The Role of the Spatial Planning Forum in Utilizing Space and Improving the Quality of Spatial Planning

- 1 Providing Recommendations for Reviewing RDTR More Than Once in 5 Years  
**Article 93 PP No. 21/2021**
- 2 Provide consideration for KKPR approval to conduct business activities and non-business activities  
**Article 113 and Article 129 of PP No. 21/2021**
- 3 Providing Facilitation for Settlement of Spatial Planning Disputes  
**Article 208 of PP No. 21/2021**

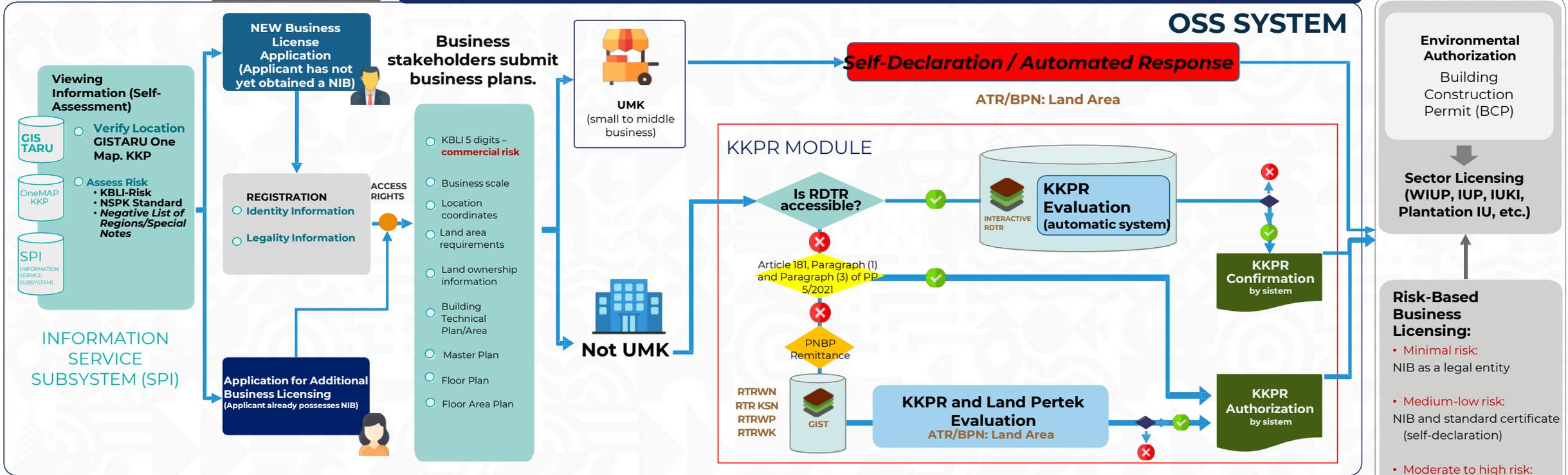
**PP No. 21/2021:** Article 93 paragraph (3), Article 113 paragraph (3), Article 129 paragraph (3), Article 208, Article 237 - 239



**Business Identity Registration Process**

**Business Process of Suitability for Spatial Plan Utilization Activities (formerly known as Location Permit)**

**Business Licensing**



✓ Exclusively for Enterprise Applicants\*

- ◆ Article 181 Paragraph (1): a. location of exclusive economic zone (KEK) or KI business operations; b. business growth; c. change of subject; d. oil and gas business sector; and e. location of enterprises owned by the authority or agency responsible for regional development in accordance with the RTR of the area.
- ◆ Article 181 Paragraph (3): the construction of MBR houses shall not exceed an area of 5 (five) hectares (.

PP No. 21/2021: Articles 100–115, Articles 135–143 of the CK Law: Article 13, Article 14, Article 15 of the CK Law

◆ PNBP in accordance of PP 21/2021, PMK 143/2021, and ATR/BPN Regulation 35/2021 Article 8(b)



## Allocation of Land Rights in Aquatic and Coastal Regions

**Law 18/2021** concerning Management Rights and Rights of Land,; **Law No. 21/2021** concerning Implementation of Spatial Planning; **Regulation of the Minister of Agrarian Affairs and Spatial Planning/Head of National Land Agency 17/2016** concerning coastal area management; Regulation of the Minister of Agrarian Affairs and Spatial Planning/Head of National Land Agency 18/2021

**Regulation of the Minister of Agrarian Affairs and Spatial Planning/Head of National Land Agency Number 17/2016** regarding Land Management in Coastal Areas is implemented through the provision of Land Rights to:

- shore; and
- **coastal waters extending from the coastline into the sea up to the provincial sea boundary**

Provision of Right for **Coastal Regions** intended for :

- building that utilized for protection and safety;
- dock or wharf;
- beachgoer safety observation tower;
- **the residence of the customary law community or its members who have inhabited that location for generations; and/or**
- power station

Issuance of Right for **Coastal Waters** Areas:

- state strategic initiatives;
- public welfare
- **settlements on water for communities governed by customary law; and/or**
- tourist

**Law No. 21/2021** (PP) Number 21/2021 concerning Implementation of Spatial Planning:

Coastal waters refer to the seas that are **adjacent to land, encompassing areas that extend 12 nautical miles from the coastline. This includes the waters that link the coast with islands**, as well as estuaries, bays, shallow waters, brackish swamps, and lagoons.

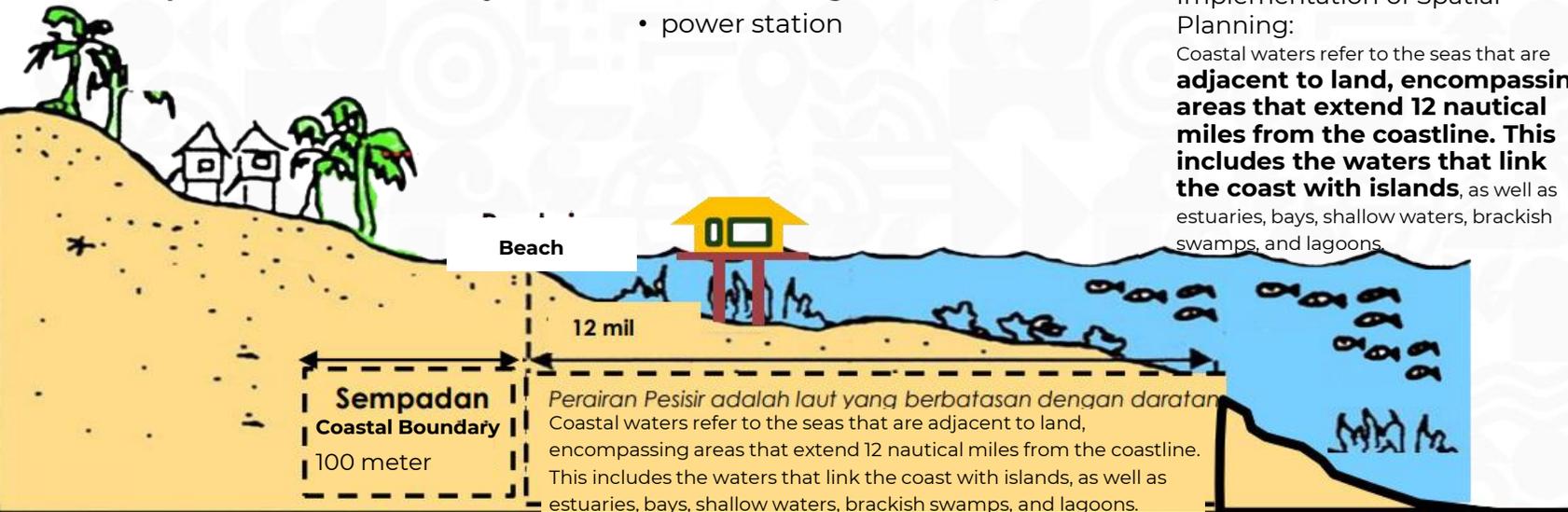
**Reinforced in PP 18/2021**

Article 65 paragraph (2) "The allocation of land rights in aquatic regions is conducted based on permits issued by the ministry responsible for government affairs in the maritime and fisheries sector, in accordance with the stipulations of statutory regulations."

**Minister of Agrarian Affairs and Spatial Planning/Head of National Land Agency Regulation No. 18 of 2021**

- For business activities, the issuance of HPL and/or HAT necessitates KKPRL approval/KKPRL Confirmation (Article 197);
- **For individuals, the provision of HPL and/or HAT necessitates the control and utilization of the land for a minimum of 20 consecutive years** by the individual or their predecessor (Article 198).

This article has been coordinated/harmonized with the Ministry of Maritime Affairs and Fisheries prior to publication.





# Existing Condition



Existed Before Independence



State Was Formed



Rules Were Made



1 Dobo, Kepulauan Aru

2 Sampit, Kotawaringin Timur

3 Lombok, Pulau Lombok



How to respond to the situation?



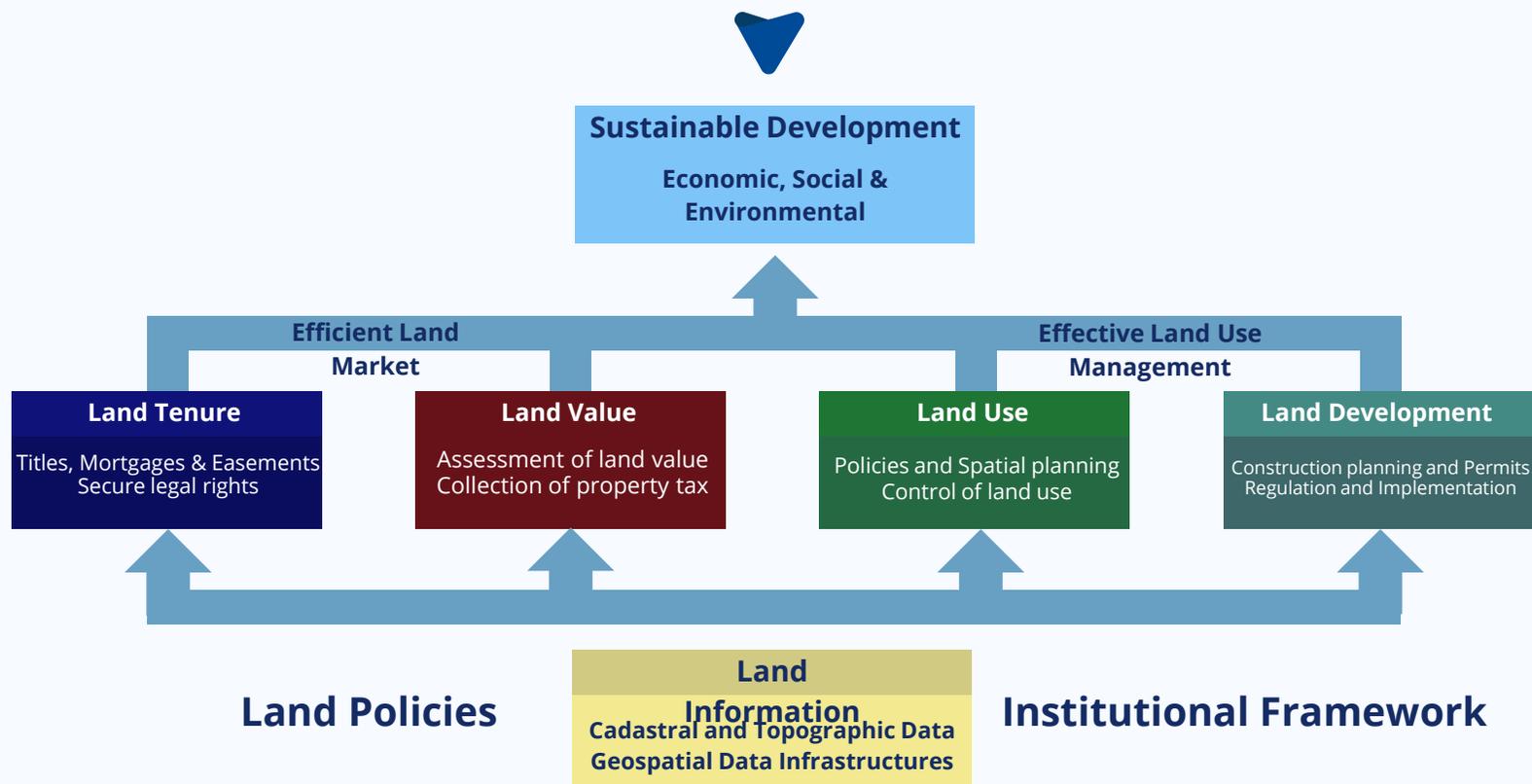


“The entire earth, water, and space, including the natural resources contained within them in the territory of the Republic of Indonesia, as a blessing from God Almighty, belong to the Indonesian nation wealth and controlled by the State as the organization of power representing all the people.”

To regulate and organize the allocation, use, supplies and maintenance

To determine and regulate legal relationships

To determine and regulate legal actions



\* In cadastre, land is considered equivalent to earth, water, and space.



# CADASTRE DEVELOPMENT

## BEYOND COMPLETE CADASTRE (Cadastre 2034)

### Thematic Map

Land tenure, land value, land use and land development

### Land Parcel Map

Land parcel map with accuracy  
 Non forest estate : 70,4 million ha  
 Parcel mapped : 55,9 million ha  
 Target : 14,5 million Ha (as of Nov 2024)

### Base Map

Orthophoto



- **Spatial Planning**
- **Smart City**
- **Urban Development and Infrastructure**
- **Disaster Mitigation and Management**
- **Many more...**

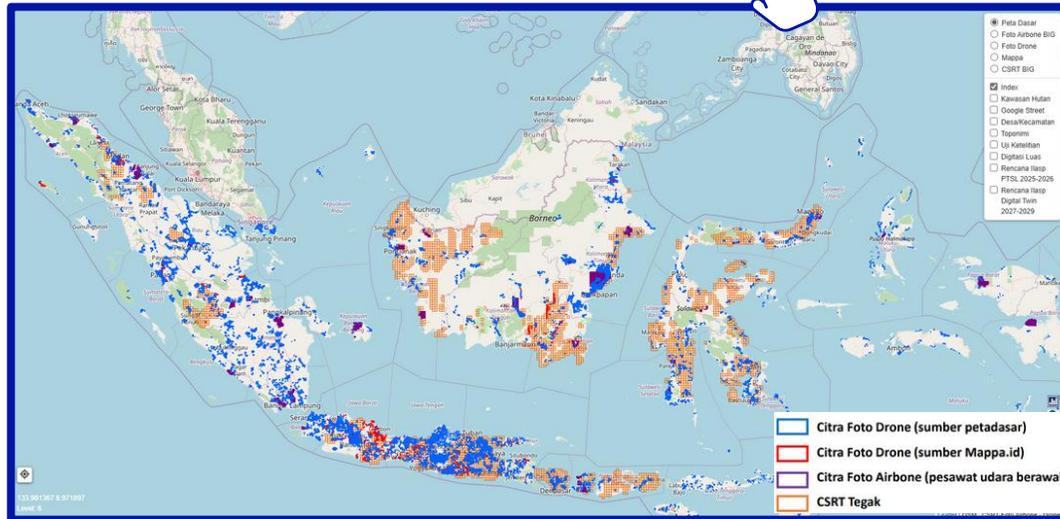
Open Land Data : Bhumi ATR/BPN

# (LAND) BASE MAP

A land base map refers to a map or model that includes CSRT, aerial photographs, elevation data, and building modeling, among other corrected forms, serving as a foundational map for all land and space mapping activities.

The Land Base Map is available on the following platforms:

<https://petadasar.atrbpn.go.id>



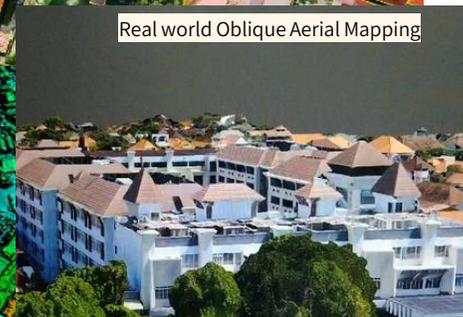
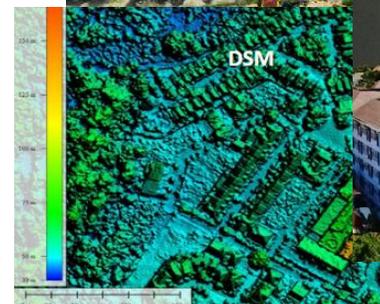
➤ Base Map uploaded as a unified source of truth for mapping activities.

➤ 2D base maps (CSRT, Orthophotos from Drone Mapping, Building footprint delineation using AI technology) and 3D (DTM, Point Cloud elevation) to facilitate multipurpose cadastre and Digital Twin.

**PDP Precision (m):**

| Tahun | GSD   | Horizontal | Vertikal |
|-------|-------|------------|----------|
| 2023  | ≤0,15 | ≤0,50      |          |
| 2024  | ≤0,12 | ≤0,40      | ≤2       |

Based on the following precision, the land base map can be utilized for large-scale mapping at a ratio of 1:1,000.



In the 2023-2024 period, a **pilot project for 3D data acquisition was conducted in 6 cities: Bogor, Badung, Denpasar, Depok, Surakarta, and Surabaya.**

It is anticipated that these 3D outcomes can be utilized for **3D-based land mapping (3D Cadastre).**

|  |  |   |
|--|--|---|
| <p>APL Area<br/>70,407,331 Ha</p>              | <p>PDP Coverage<br/>41,307,424 Ha</p>                        | <p>Not yet available<br/>29,099,907 Ha</p>        |
| <p><b>3,196</b><br/>25,508,716 if<br/>CSRT</p> | <p><b>61,333</b><br/>2,207,988 Ha<br/>Aerial Photographs</p> | <p><b>377,520</b><br/>13,590,720 Ha<br/>Drone</p> |

# Case Study

Bali, Indonesia

<https://petadasar.atrbpn.go.id>



The selection of locations based on regions that have evolved into fully developed cities or regencies (**Complete City/Regent = 104 in 2025**), as well as urban areas currently undergoing organization and preparation to achieve full city or regency status, with the aim of enhancing **B-Ready (formerly known as Ease of Doing Business (EoDB))**.



## Above and Below Ground Mapping Concept

Map the plot of land

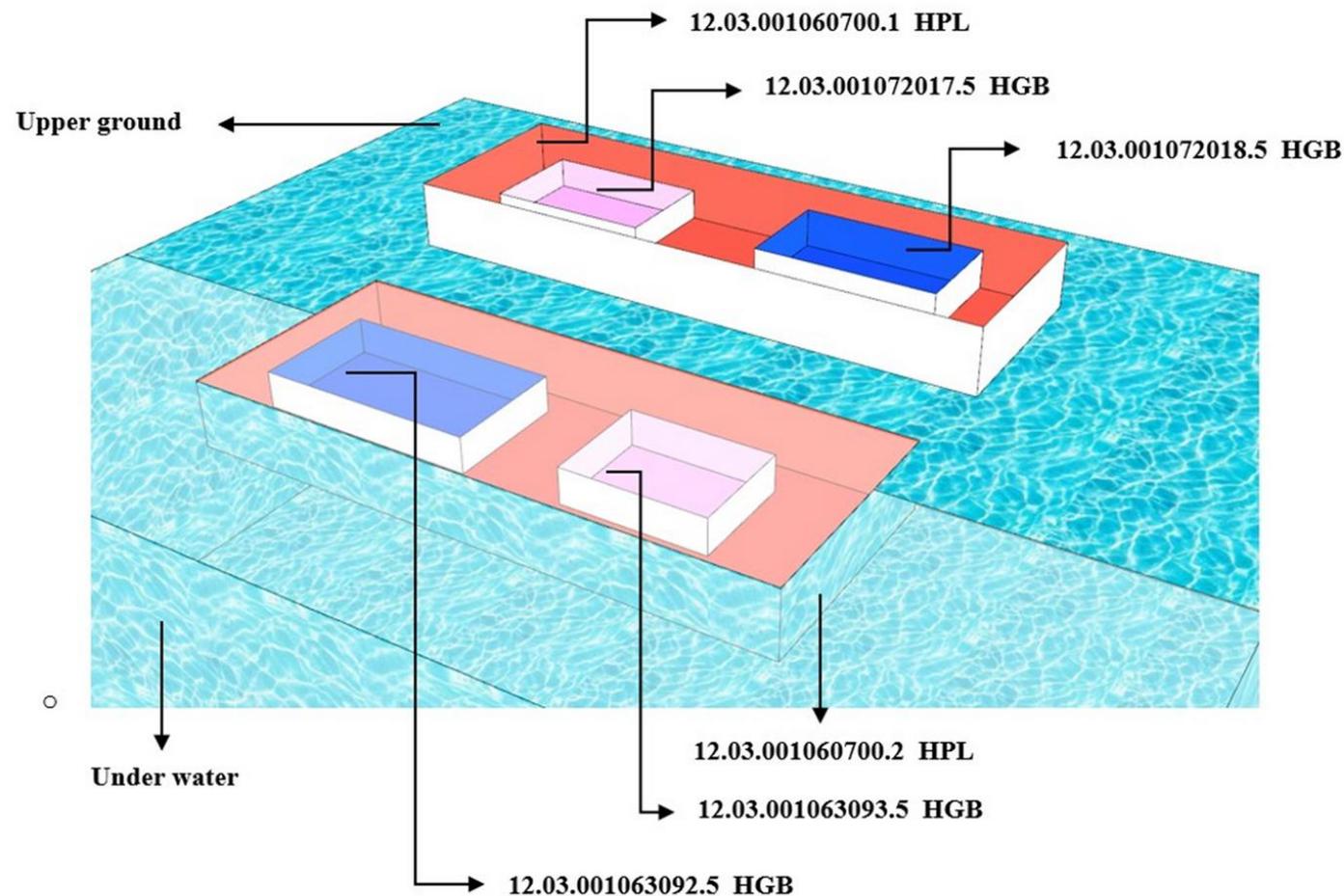


Give the land unique parcel code



**Right Granted, but the landuse is limited**  
(Rights, Restriction, Responsibilities)

**Final Target:** Protect community rights, but also maintain ecosystem sustainability.



## Case Study

### Granting Land Titles for settlements of indigenous people in coastal areas in Southeast Sulawesi Province



\*former President, Joko Widodo

In the 2022 GTRA Summit, the President presented **525 land titles** to the Bajo Tribe, who reside on the water, as representatives of **6,437 land titles** that will be distributed from all districts in Southeast Sulawesi Province, with the following details:

| No.   | Desa/Kelurahan     | Kecamatan           | Jumlah |
|-------|--------------------|---------------------|--------|
| 1.    | Tindoi             | Wangi Wangi         | 38     |
| 2.    | Tindoi Timur       | Wangi Wangi         | 12     |
| 3.    | Mola Selatan       | Wangi Wangi Selatan | 56     |
| 4.    | Mola Utara         | Wangi Wangi Selatan | 33     |
| 5.    | Mandati II         | Wangi Wangi Selatan | 170    |
| 6.    | Mola Samaturu      | Wangi Wangi Selatan | 25     |
| 7.    | Mola Bahari        | Wangi Wangi Selatan | 77     |
| 8.    | Mola Nelayan Bakti | Wangi Wangi Selatan | 114    |
| TOTAL |                    |                     | 525    |

It has been asserted by the Mandati tribe, the indigenous people of Wakatobi, that the Bajo tribe was granted permission to stop or dock solely by the Mandati tribe, who traditionally govern the Wakatobi region. Therefore, it is essential to carry out a **historical investigation** concerning the acquisition of **rights over water through social mapping activities**.



## Concept and Application of Rights, Restrictions , and Responsibilities (3R)

in line with the Circular Letter of the Minister of ATR/BPN number HT.03/757/VI/2022 regarding the Implementation **Guidelines for Granting Land Rights in Water Areas on June 3, 2022**

### Right

- Rights are conferred as **time-limited entitlements.**
- Preceded by commercial licensing (KKPR/KKPRL)
- If the rights are "Right of Ownership" then they can be given in the form of communal/joint ownership.

### Restriction

- Prohibition on the transfer of Land Rights to legal entities or individuals outside the local indigenous, local, or traditional community.
- Restriction on the alteration of Ownership Rights;

### Responsibility

- **Utilization of land for residential purposes, public amenities, social services, and/or other auxiliary facilities;**
- If reclamation is to occur in the future, it will necessitate approval from the relevant agency in accordance with applicable laws and regulations.





# 38 TGI (Thematic Geospatial Information) Ministry of Agrarian Affairs and Spatial Planning/BPN

(Attachment I (One) to the Regulation of the Minister of Agrarian Affairs and Spatial Planning/National Land Agency Number 1 of 2023)

## Directorate General of Land Use Planning

1. IGT National RTRW
2. IGT RTRW Province
3. IGT RTRW District/Region
4. IGT RTRW Urban Area
5. IGT RDTR Border Region
6. IGT RTR of Islands
7. IGT RTR National Strategic Zone
8. IGT RDTR Municipality/City

## Directorate General of Agricultural Planning

1. IGT Allocation of Community Land Empowerment Sites
2. IGT Land Technical Factors
3. IGT Essential Land Inventory
4. IGT Allocation of Land Assets for Agrarian Reform
5. IGT Assessment of Land Assets for Agrarian Reform
6. IGT Potential Land Redistribution Items
7. IGT Unprocessed Rice Field
8. IGT Land Proficiency
- 9. WP3WT Potential IGT**
10. IGT Land Utilization Balance Sheet
- 11. IGT Distribution of Outermost Small Islands in Indonesia**

## Directorate General of Land and Space Management and Regulation

1. IGT Land Marked as Abandoned
2. IGT Safeguarded Rice Fields
3. IGT Area Marked as Abandoned

## Directorate General of Land and Spatial Surveying and Mapping

1. IGT Land Area (Parcel)
2. IGT Fundamental Land Components
3. IGT Crossing Forest Zone Boundaries
4. IGT Land Tenure
5. IGT Property Ownership
6. IGT Land Utilization
7. IGT Land Use

## Directorate General of Land Dispute Resolution and Conflict Management

1. IGT specific Concerning Land Disputes, Conflicts, and Cases

## Directorate General of Land Acquisition and Development

1. IGT Potential Land Consolidation Topic
2. IGT Land Consolidation
3. IGT Land Area Assessment
4. IGT Land Consolidation Plan
5. IGT Outcomes of Land Consolidation Design Application
6. IGT Allocation of Land Development Potential
7. IGT Land Valuation Zone

## Directorate General of Land Rights Assessment and Registration

1. IGT Property Rights

### DATA ENHANCES ENRICHMENT OF DERIVATIVE THEMATIC ANALYSIS

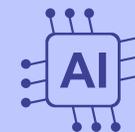
#### Open Geospatial Large Data



openroute  
service



#### Crawled data



Artificial Intelligence  
Technology



Lamudi.co.id



OpenStreetMap

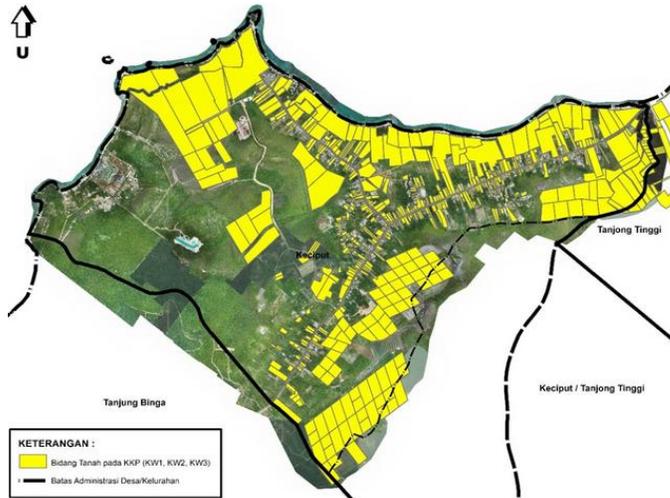
rumah123.com  
Jual Beli Properti Jadi Mudah



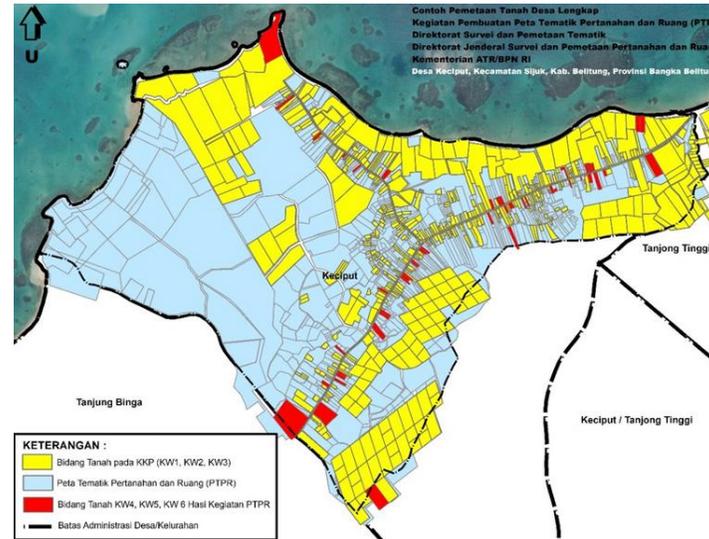
# Case Study

## Data Quality Enhancement Initiative Acceleration Strategy (through parcel-based thematic mapping) - **Belitung**

Before:

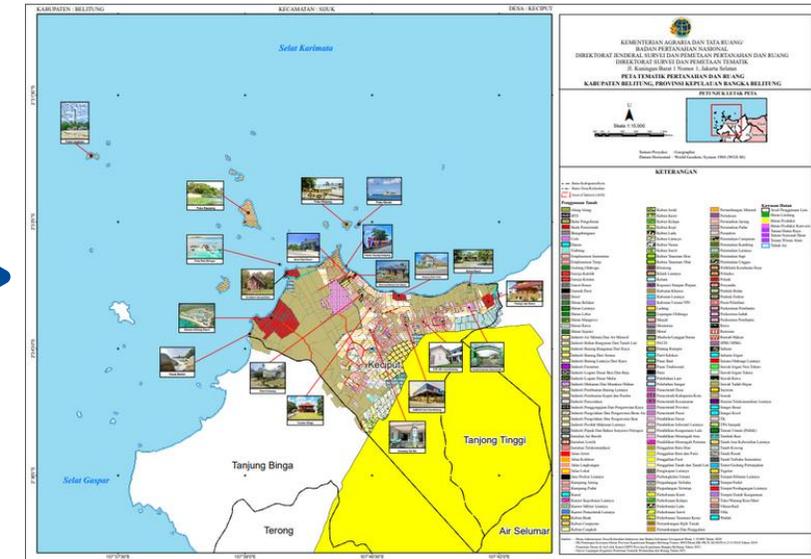


There are still unmapped areas and areas that have been registered but not yet mapped (K4).



The Thematic Land (parcel-based) (PTPR) activity in Belitung Regency resulted in Complete Village Mapping.

PTPR can assist in **identifying the 'flying' parcel (K4) and enhance the quality of parcel.**

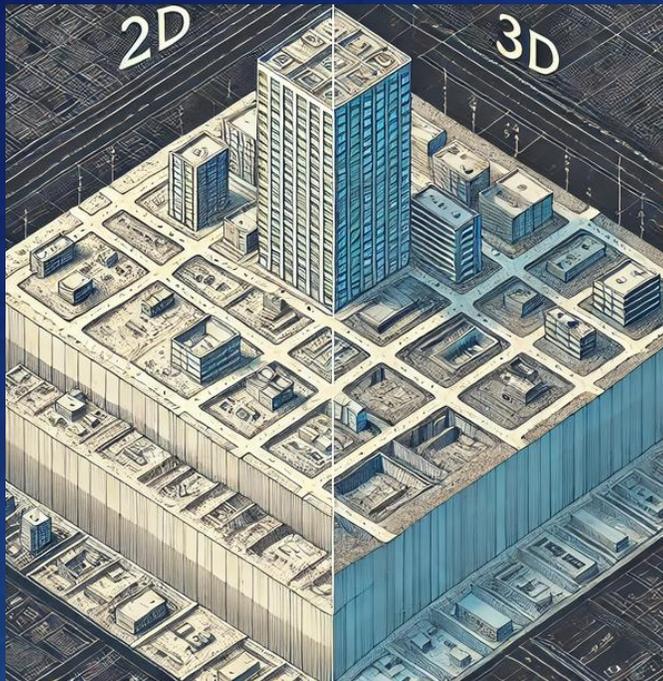


Once the village is completely mapped and filled with attributes of land ownership, land tenure, land utilization and land use, potential locations for development can be identified by adding several parameters.

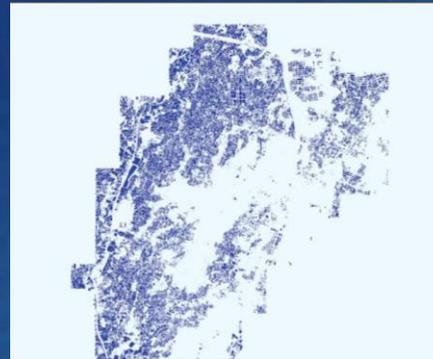


# the next chapter >>>>

## 3D CADASTRE – THE FUTURE SOLUTION FOR LAND MANAGEMENT



*Represent Right, Restriction and Responsibility*

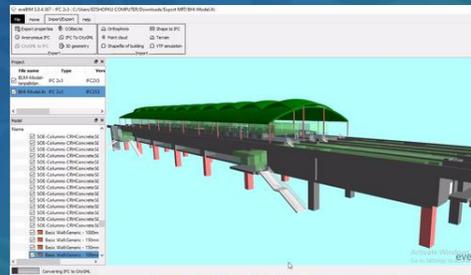


MORE REALISTIC VISUALIZATION



SUMBER : PT. DEIRA

ACCELERATE THE LEGALIZATION OF VERTICAL SPACE



UPPER & UNDERGROUND MAPPING



DIGITAL TWIN & SMART CITY





# FINAL TARGET: OPEN LAND DATA



### Internal

Support Land Tenure, Land Value, Land Use, and Land Development



### External (Government)

Tax Data Integration



### External (Private Sector)

Thematic Derivatives, Business, Property, and Environment

## LAND BASED (CADASTRE)





Restriction  
Responsibility

Restriction  
Responsibility

Right

Right

LAND RIGHT AND OWNERSHIP



LAND AND PROPERTY DATA  
INTEGRATION



CADASTRE 4D



OPEN LAND DATA AND  
TRANSPARENCY



BUSINESS LOCATION



## Concluding Remarks

- The potential of Indonesia's territory, two-thirds of which comprises seawater, has not been optimally harnessed for cultivation activities in aquatic and coastal regions.
- Current laws and regulations adequately provide a legal framework for the allocation of rights over these waters and coastal areas.
- The need of Marine Cadastre to regulate any activities in coastal areas across Indonesia





UN-GGCE International Workshop  
**JOINING LAND AND SEA**  
The Integration of Terrestrial, Maritime, Built, and Cadastral Domains

*Terima  
Kasih!*  
*Thank You.*



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