



XXVII FIG CONGRESS

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Volunteering
for the future –
Geospatial excellence
for a better living

Institutionalization of UAVs for Land Affairs and Spatial Planning in Indonesia

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ORGANISED BY

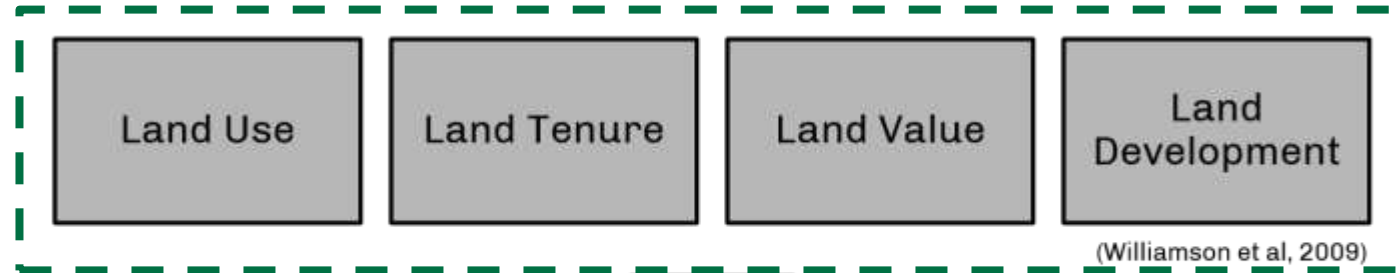


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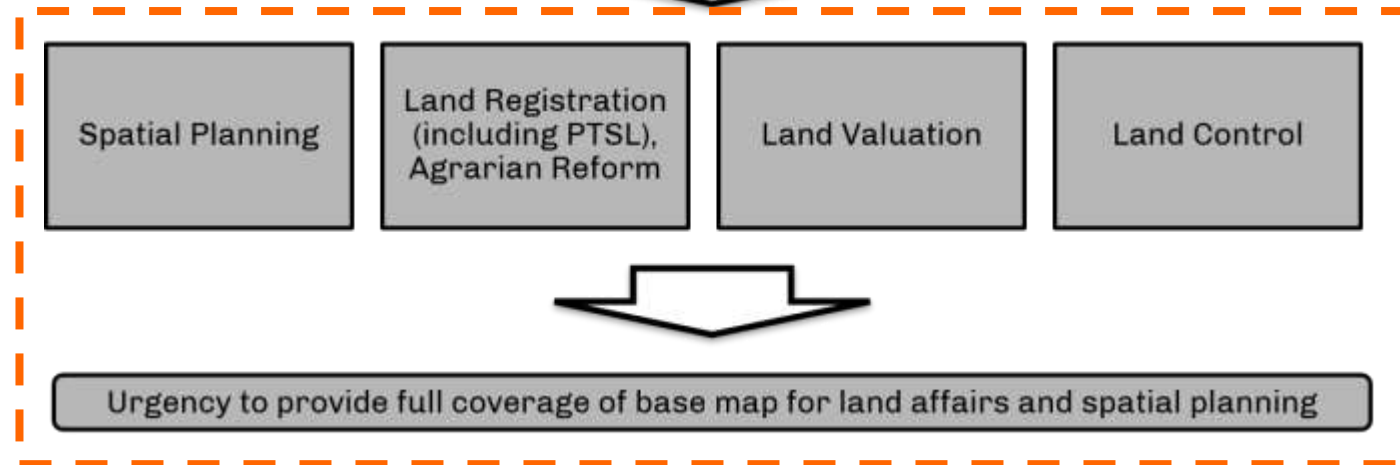


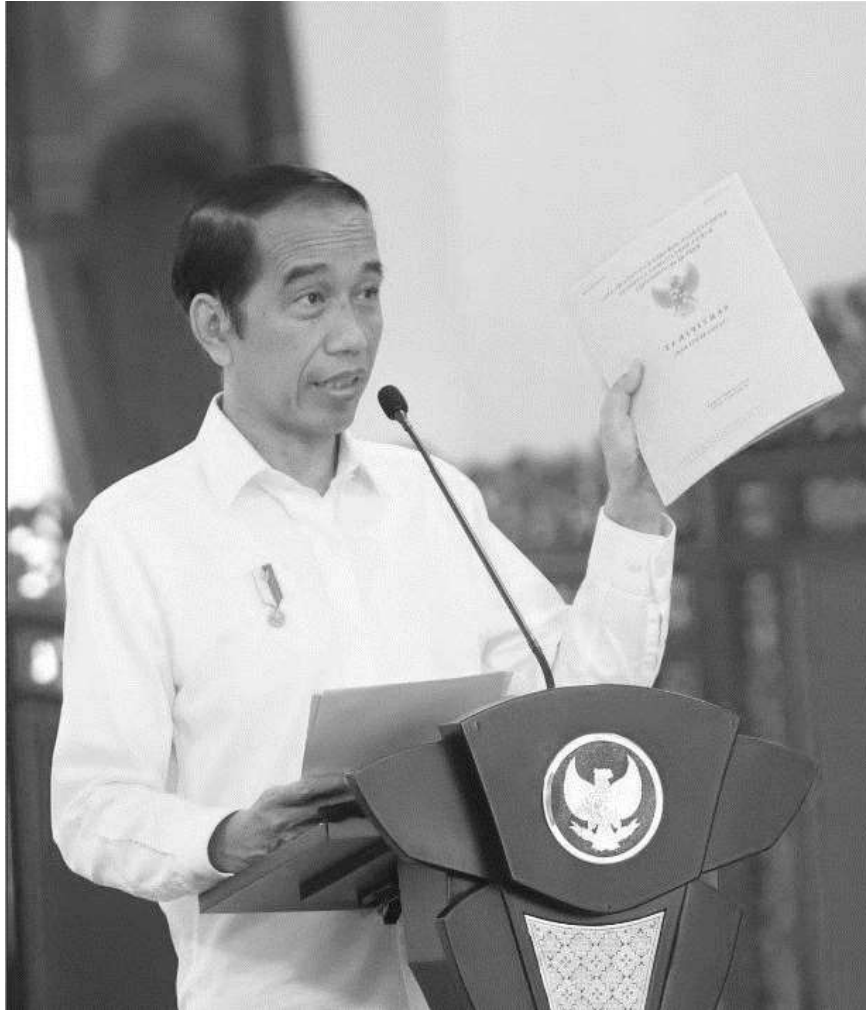
IMPLEMENTATION OF LAND MANAGEMENT PARADIGM

LADM Paradigm



Land Policy in Indonesia (2020 – 2025)





(Republic of Indonesia, 2020)

“All land in Indonesia
must be registered by 2025...”

—Ir. Joko Widodo
President of Indonesia

Land Management
& Spatial Planning
Agendas

Mandate from the
President

Digital
Transformation

2017 – Initial Year of PTSL
(Complete-Systematic Land Registration)

Needs for
Base Map

Development
of UAVs

Efforts to Institutionalize UAV

 Legal Instrument



 Human Resources

 Equipment

 Pilot Project



UAV Operations



-  Firstly established in 2015
-  Regulated by Ministry of Transportation, Involvement of the Ministry of Defence cq. Indonesian Airforce (Security Clearance dan Security Officer)

Base-mapping using UAV



-  Ministry of ATR/BPN regulated the base-mapping activity using UAV for Land and Spatial Affairs in 2019
-  In 2020, Geospatial Information issued the first regulation: the use of non metric sensor for base-mapping

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Certifying Pilot

- A requirement for licensed pilot and registered UAV to any projects with flying height above 120 meter
- The certification was held by Indonesian Aero Sport Federation (FASI) and the Indonesian Aviation Navigation Organizing Agency (AirNav)
- There are 135 officer of ATR/BPN that has been certified as UAV pilot.

Training for Data Processing

- The courses outline for the training were arranged to meet the requirement for operator to process data from aerial photography using UAV

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26 fixed-wing UAVs purchased and delivered to the Regional Offices of National land Agency

Issues with the procurement is the maintenance

A solution was proposed: implement the rental system instead of buying a new unit.

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I	AREA OF INTEREST	
a.	Number of Village	38
b.	Total Area	6000 Ha
II	UAV SPECIFICATION	
a.	Type	V-TOL (Vertical Takeoff Landing) + PPK
b.	Max flying duration	120 Minutes
c.	Max range	15 Km
III	CAMERA	
a.	Type	42 MP Sony DSC RX1 RII
b.	Lens	Fixed Lens
IV	FLIGHT PLAN	
a.	Height	300 Meter
b.	Overlap (Fwd/Side)	80/75 %
c.	GCP	74 Points
V	PELAKSANAAN	
a.	Personnel	13 Surveyors
b.	Project duration	13 days (19 to 31 Okt 2020)
c.	Number of Take-off-Landing)	30 Times

EVALUATION

MAN

- The capacity development conducted already gave a significant value to the project actualization.
- Training for UAV imageries data processing are still needed

METHOD

- Concerns or constraints related with the method: accuracy, flying permits, and inadequate equipments
- A further confirmation to the respondents gave an overview that there have been several different treatments happened in the field in terms of the application for flying permit.

MATERIAL

- Already using the same source for administrative boundary
- Reference points used: CORS Data, 2nd Order (Odre 2) Technical Base Points, and the elevation reference from an opensourced Shuttle Radar Topography Mission (SRTM).

MACHINE

- Using a rented UAV with minimum specification of vertical and take-off (V-TOL) landing feature with PPK
- Issues: workstation and software was not sufficient enough to process the data

MONEY

- Average cost per hectare is USD 3,57
- It was suggested in the future for a consideration to include the cost for shipping and UAV transporting

FINDINGS & CONCLUSION

The use of UAVs is considered efficient to be conducted for providing large-scale base-map with an area that is relatively not large

Utilization of UAV is also suitable for land analysis project that requires the availability of the latest photo map updates in a certain area

With the ability of UAV that is increasingly developing, it is possible to be the solution for the needs of base map, e.g. need for an updated, better quality, or time series data;

The production of land base map using UAVs needs the support and cooperation from the external stakeholders related

THANK YOU
Dziękuję Ci
TERIMA KASIH