



FIG PAPER 7011

EVALUATION OF INDONESIAN LAND BASE MAP FOR CADASTRAL APPLICATION KUALA LUMPUR, 17 JUNE 2014

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NATIONAL LAND AGENCY - INDONESIA

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outline:



1. Introduction

- Background & Objectives

2. Methodology

- Measure and sampling & Method

3. Analysis (SWOT Analysis)

4. Findings

- Availability of Land Base Map
- Effectiveness of Land Base Map Usage
- Constraints and Barriers

5. Recommendations & Acknowledgement

INTRODUCTION



Indonesian Land Base Maps

Mainly produced in 3 level of map scales:

- a. 1: 1.000 (very detail scale) – sources: aerial photo, VHRSI
- b. 1: 2.500 (semi detail scale) – sources: HRSI
- c. 1: 10.000 (medium scale) – sources: MRSI

Various formats: digital vector maps, aerial photograph, satellite imagery, old hardcopy maps

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IMAGERY	RESOLUTION	COVERAGE (Ha)	LOCATION
Raw Data SPOT-5	2.5 m	26.500.000	Part of P Sumatera
		18.500.000	P. Sulawesi
Raw Data Quick Bird	0.6 m	10.000.000	P. Jawa, P Bali, Nusa Tenggara
Raw Data Quick Bird	0.6 m	120.000	P. Sumatera, dan Kalimantan
Raw Data SPOT-5	2.5 m	1.600.000	P. Papua
Raw Data SPOT-5	2.5 m	2.000.000	KalSel, Lampung
Raw Data Quick Bird	0.6 m	900.000	P. Jawa, Maluku, Maluku Utara
Raw Data SPOT-5	2.5 m	2.850.000	Kep. Riau, KalSel, P Belitung
Peta Citra Format Sederhana Berbasis Web	0.6 m	60.000.000	Indonesia
	15 m	190.000.000	

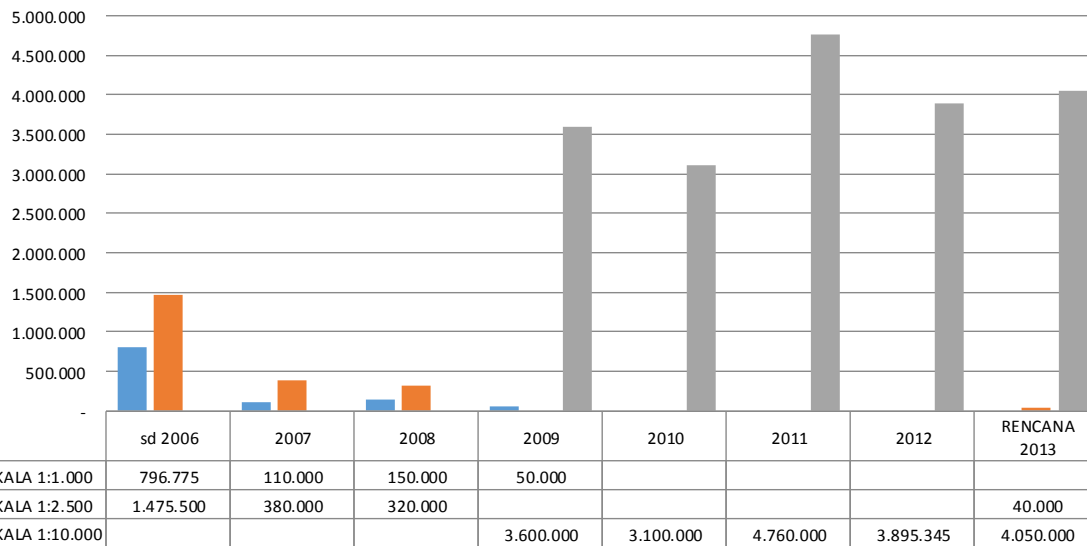


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Statistics (of land base map)

LUAS PETA DASAR DIPA PUSAT BERDASARKAN SKALA PETA

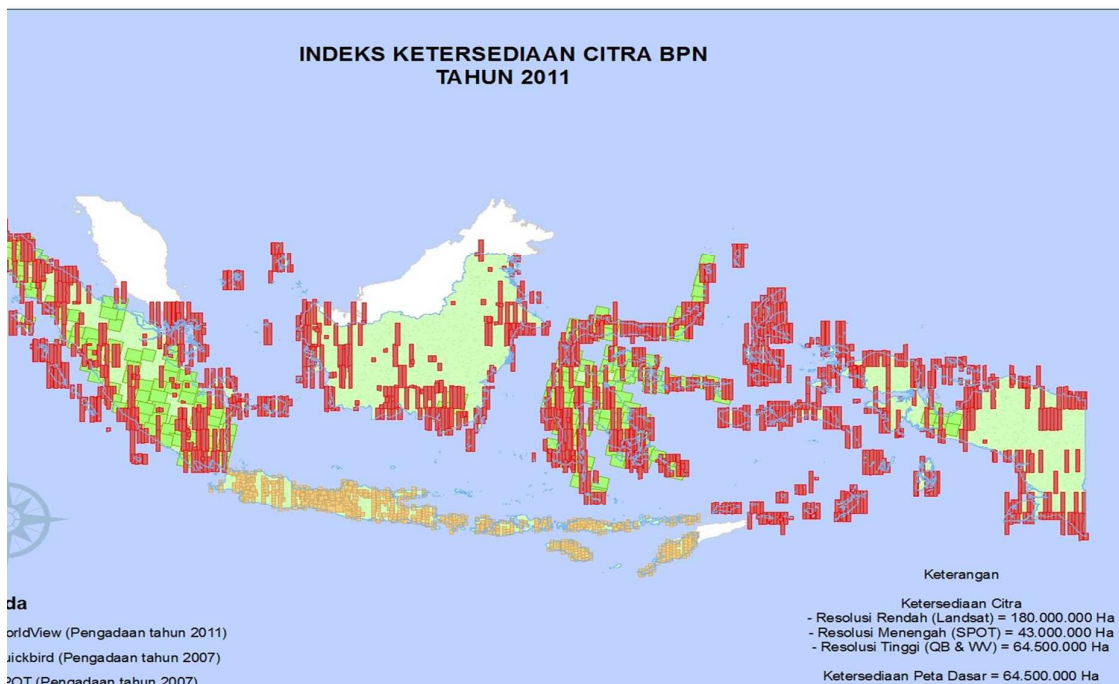


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Satellite Imagery Availability



INDEKS KETERSEDIAAN CITRA BPN TAHUN 2011



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Background

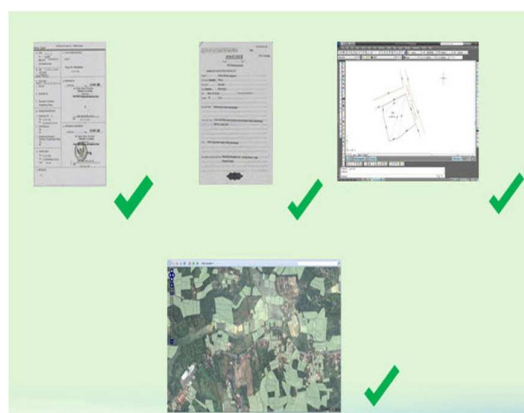
Land base map

Land base map (LBM) is fundamental as **a spatial basis** for parcel-based cadastral application such as land registration, land use management, land valuation

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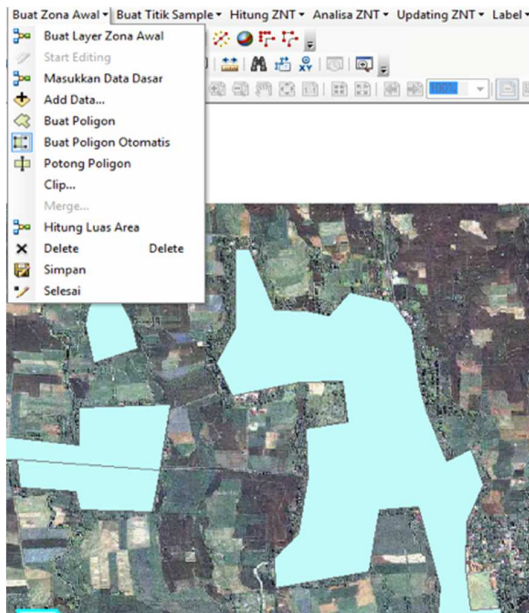
Example of land base usage



Plotting land parcel vector data (boundary) – linked land parcel (textual) attributes and map (spatial)

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Preliminary zone for land value digitizing based on land base map



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Objectives

Are the maps used? Which one is more useful? To what application? In which provinces?



OBJECTIVES

- To inventory all available types of land base maps in various formats and scales, as well as the facilities and available mapping infrastructure
- To identify and assess the effectiveness of land base map usage
- To identify and assess the various constraint and obstacles of land base map usage

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METHODOLOGY



Approaches

- ❑ Variables: types, effectiveness, obstacles/constraints
- ❑ Distribution of questionnaire
- ❑ Analysis unit: BPN Provincial offices (13) and Land Offices (26) using purposive stratified sampling approach
- ❑ Analysis: descriptive statistical analysis, categorization, difference test Kruskal Wallis, importance performance matrix, and cluster analysis
- ❑ SWOT analysis to build a recommendation of usage

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Analysis

- ❑ Descriptive statistical analysis: used to calculate the percentage of respondents who answered particular questions to understand BPN's office profiles
- ❑ Categorization: Categorizing the offices and indicators into high, medium, and low categories
- ❑ Data transformation: transforming ordinal data to interval data
- ❑ Normality test: to make the data distributed more normal
- ❑ Kruskal- Wallis to analysis the characteristic difference among sample categories (Provincial vs Land Office Base map usage if the human resources minimum, Western vs Eastern part)
- ❑ importance performance matrix (importance & usage in BPN Provincial & Land Office, equipments)
- ❑ SWOT analysis to build a recommendation of usage

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SWOT analysis of utilization

Strengths (S)

BPN head quarter (BPN RI) has provided land base map in various types, formats, and scales for the purposes of Kanwil dan Kantah.

All Kanwils and Kantahs offices has already using land base maps for parcel delineation and other uses (thematic mapping). There is high motivation of BPN's human resources to use land base map and improve technical self-competence

The implementation of Geo-KKP policy has motivated leaders and staff to utilize land base map in land parcel mapping. All Kanwils and Kantahs already have infrastructure for surveying, measuring, and mapping.

All Kanwils and Kantahs already have infrastructure for archiving land base map.

Weaknesses (W)

1. Land base maps provided from BPN are not encompass the entire service territory and need updating for certain areas so in fact the Kanwils and Kantahs are using alternatif base map from other sources.
2. In several aspects, the quality of land base map provided BPN are not standard (scale, resolution, processing process).
3. Not all alternative base maps from other sources are complying with the BPN standard.
4. Lacking of BPN's human resources who have adequate educational background, trainings, and functional position in working with land base maps for public services.
5. Old people employees. Around half of survey and mapping staffs are more than 40 years old.
6. Lacking of survey and mapping facilities and infrastructure
7. Lacking of archiving facilities and infrastructures in Kanwils and Kantahs.
8. Limited and unstable internet connection to operate web-based Geo-KKP.
9. Unstable electricity power in the offices (would disturb the computers and equipments)
10. Development of knowledge and expertise as well as the placement of employees have not been programmed properly.
11. Land base map inventory and archiving have not done well.
12. There is undistributed and socialized land base map to the lowest hierarcical structure.
13. Not all Kanwils or Kantahs have high support from the leaders

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Opportunities (O)

1. Technological developments for survey and mapping.
2. Technology usage in records management (electronic records management).
3. Bureaucratic reforms to achieve proportionate number of civil servants and professionals.
4. Benefits from out sourcing
5. Usage of cloud storage for land base map archiving
6. Licensed surveyor policy

Threats (T)

1. Good and Clean Governance.
2. Bad effect of outsourcing
3. High volume of plotting land parcel to land base map
4. The complexity of BPN problems.



FINDINGS

Availability of Land Base Map

- There are 38 offices (98%) that have land base map given by BPN RI in digital format with varying scale of 1: 10.000, 1:1.000 and 1: 2.500
- There are 24 offices (62%) that have and use base maps from other institution
- There are 10 offices (26%) that have land base map in aerial photo/images, 25 offices (64%) that have land base map in aerial photo/images and vector maps, and only 4 offices (10%) that only have land base map in vector format.

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FINDINGS

Effectiveness

- 98% offices uses the land base maps given by BPNRI effectively.
- From a total of 39 offices, 2 (5%) claimed very dissatisfied, 8 offices (21 %) were not satisfied, 18 offices (46 %) said they were satisfied, and 11 offices (28 %) were very satisfied

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FINDINGS

Constraints and Barriers

Data sources:

- Image map scale of 1 : 10.000 is too small for cadastral application such as boundary mapping and reconstruction. It makes the clear interpretation is quite difficult.
- Scope/national coverage: only 13,39% out of 190 million hectares of land.
- Only 50% of the employees in the division have the required competencies and skills required for the position. Competence includes the ability to use devices terrestrial surveying, GPS receivers and data processing, to draw using AutoCAD/GIS software.
- There was a problem about employee rotation and mutation that sometimes too often. It makes the staff could not focus in one steady position and skill.

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FINDINGS

Constraints and Barriers

Human resources:

- 56% of the offices were stating that they have no adequate employees. Approximately 28.7% of the employees in the Survey and Mapping Division are above 50 years old and soon to retire.
- Approximately 56% of the employees only have high school equivalent education and D1. Approximately 41.3% of employees have suitable educational qualifications and approximately 58.7% did not have appropriate background. Number of employees that have functional position is less than 4%.

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FINDINGS

Constraints and barriers

Infrastructure and facilities:

- Several Kanwils and Kantah still do not have adequate equipment for specific purposes. From 39 offices only 72% have the measuring tape, only 77% have Theodolite T0; Theodolite Electronic Total Station (ETS) is 90%; Handheld GPS is 90%; Geodetic GPS/CORS is 64%; computer for mapping is 95%, and computer storage for spatial database is 82%.
- Kanwils and Kantah were not entirely have the ideal infrastructure to work. From total, 38% still have no working room where every work can be done properly.
- In general, Kanwils and Kantahs do not have reliable infrastructure and records management system. From 39 offices, 51% offices have poor infrastructure and facilities. This condition shows that land base map management has not been a priority.

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RECOMMENDATIONS



Based on the results from the assessment and SWOT analysis, we recommended some strategies to enhance the use of land base map at BPNRI:

- Improve the quality of land base map from scale, resolution, and process. Meaning the produced scale should be in detail scale (1:1.000 or 1:2.500).
- Extending the coverage of production, not only focuses on big cities but also cover rural areas.
- Developing and using cloud storage technology as a mirror for distributing the maps so there is no more complain about accessibility
- Capacity building to upgrade land surveyor expertise and skills by technical training, reward and punishment method, and other relevant actions.
- Assets (tools and equipment, hardware, software, maps) management
- Infrastructure development is a must
- Archive management needs to be established.

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THANK YOU



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